



WELDED
Solid Steel Windows
and
Industrial Doors

GEORGE KABURECK
477 STATE ST.
Tel 5-5305, BRIDGEPORT, CONN.



WELDED

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and
Industrial Doors

FEDERAL WELDED

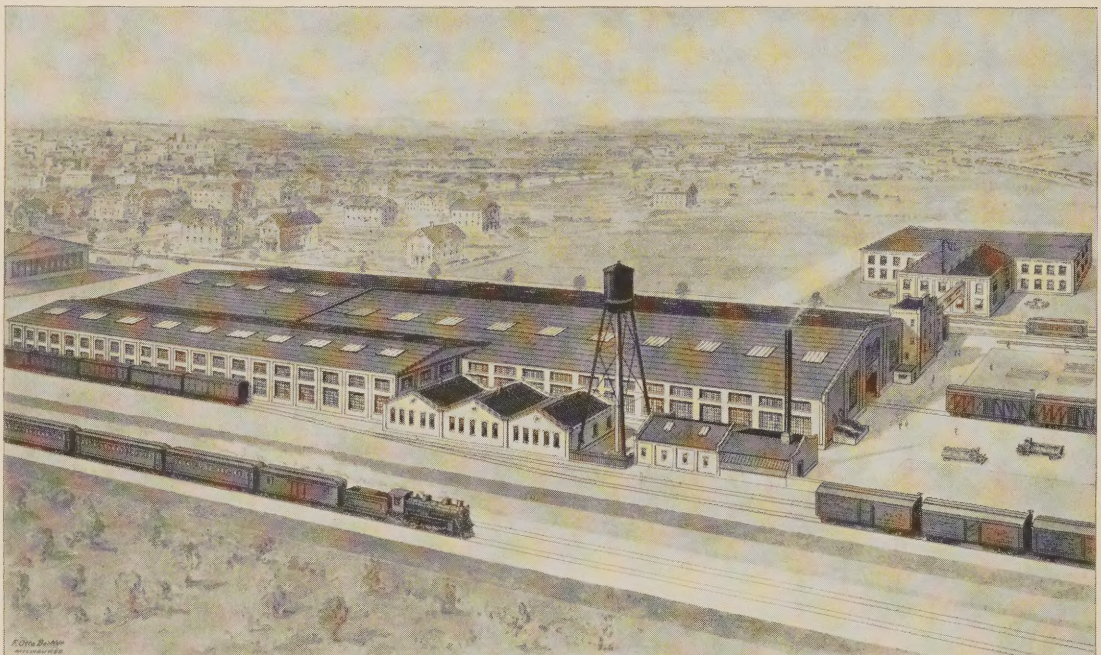
Solid Steel Windows *and* Industrial Doors

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477 STATE ST.
Tel 5-9885, BRIDGEPORT, CONN.

FEDERAL STEEL SASH COMPANY
Waukesha, Wisconsin



REGISTERED U. S. PATENT OFFICE
TRADE MARK



Plant and General Offices at Waukesha, Wis.

FOREWORD

In preparing this Edition of our General Catalog, we have endeavored to present information pertaining to our products in as concise and usable a form as possible, and thus to increase the usefulness of the Catalog to Architects, Engineers, Draftsmen, Contractors and others interested in Industrial Steel Windows and Doors.

A General Specification has been written for all products. The illustrative Plates have been revised and are to scale, and may therefore be used for detailing.

We wish to particularly call attention to the additions which have been made to, and changes made in, our products since the publication of our last Catalog, involving Utility, Architectural Projected, Industrial Detention, Security, Protection and Basement Windows, and Bifold, Canopy and Two Section Vertical Lift Doors.

We hope that this Catalog will fulfill its purpose and accomplish our intentions.

FEDERAL STEEL SASH COMPANY.

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GENERAL INFORMATION

WINDOWS

Ever since their introduction fifteen years ago, **Federal Arc Welded Windows** have had an unique position in the Building Industry, being **the only Windows with fully welded joints.**

Steel Windows have members joined in one of two ways—either by mechanically formed connections or by welding. Mechanically formed joints are interlocked, that is, the members are so interwoven that they cannot be forced apart; or mitre-dovetailed, requiring some locking device to prevent the members separating.

Most **interlocked joints** require bending or expanding of the metal in one or both members and all have **overlapped surfaces or butt edges**, or both. **Mitre-dovetail joints** do not require bending or expanding of the members, but are so made that the two members can be separated unless locked. The method of locking is to **tack-weld the members after the mechanical joint has been made.** This tack-weld does not add to the strength of the joint, but does stiffen it and prevents movement in the plane of the Window. **An understanding of the purpose and result of tack-welding is necessary to properly compare such a joint with one fully welded, welded both in face and in depth,** as tack-welded Windows are sometimes mistaken for welded Windows. **Mitre-dovetail joints** have either **overlapped surfaces, butt edges**, or both.

Federal joints are welded along the full line of intersection of the two members, both in face and in depth. All overlapped surfaces and butt edges are eliminated. No openings exist, as in the case with both interlocked and mitre-dovetailed joints, where moisture can seep in and set up corrosion, which will eventually result in failure of the joint.

No motion is possible between the members, as is true with interlocked joints, and the Window will not rack out of square in shipment or installing.

Being **fully welded** both in face and depth of the members, **the full section strength is utilized**, both in the plane of the Window and vertically to the face, which latter is the direction in which the wind load is imposed upon the Window.

Use of the full section strength of the members, which is not the case in either interlocked or mitre-dovetailed joints, produces a Window with greater strength and less deflection for the same depth of section or of the same strength and deflection for a section with less depth, compared to a Window with mechanical joints.

To fabricate a mechanical joint, either interlocked or mitre-dovetailed, it is **necessary to cut away a portion of both members** and thus reduce the strength of the sections. **This reduction of the section may be as much as 50%.** As the strength of the Window and its resistance to deflection is deter-

mined by the weakest point, the joint, it follows that there is material in the section between joints which is adding nothing to the strength or stiffness of the Window and which is useless weight. This condition should be kept in mind when a comparison is made of weights of Windows or of gross sections of members. **Weight alone does not make strength.**

In making a comparison of the strength and stiffness of Window sections, the distribution of metal in the section is of great importance, and as profiles of Window sections vary greatly **the only accurate method of comparison is by a mathematical computation (the section modulus) of the strength of the net section**, allowing for all cut out portions at the joint. Such a computation, taking **Federal** both for strength and weight per foot as 100, gives strength down to 21.7 with a weight of 107.2 and weight up to 138.7 with strength of 39.1. These figures show the impracticability of estimating the strength and resistance to deflection taking into consideration depth and weight of section only.

Mechanical joints which are not tack-locked result in a Window which will rack out of shape. This movement prevents the accurate fitting and weathering of the Ventilator in the shop before shipment and necessitates this important work being done by inexperienced and high priced labor in the field. **Federal Windows**, not being subject to racking in shipment and installing, **have the Ventilators accurately weathered at the shop by experienced workmen** working under the most favorable conditions. As a result, tests made by disinterested engineers show the infiltration of air through **Federal Window Ventilators** to be materially less than through others.

Protective coatings, paint, rust proofing or galvanizing, can be applied to **Federal Windows** without danger of the coating being ruptured at the joints through racking of the Window.

Federal Windows, with members without moulded faces, ridges and projections and without overlapping surfaces and butt edges, can be more effectively and more economically maintained than Windows with these features.

Federal Window muntins have ample depth from face to edge of stem for efficient **double glazing.**

In keeping with the general design of **Federal Windows**, the hardware used has been developed with care. **Pressed steel parts** have been used wherever possible in place of castings, with improvement in appearance and elimination of weight. The viewpoint of the user has been kept constantly in mind and the design worked out for the easiest and most convenient operation.

Federal vertical mullions, adjustable both vertically and horizontally, are easy to set and eliminate prys, drifts or hammering to force Window units into place.

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SPECIFICATIONS

FOR

HORIZONTALLY PIVOTED COMMERCIAL PROJECTED ARCHITECTURAL PROJECTED	UTILITY INDUSTRIAL DETENTION SECURITY
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PROTECTION WINDOWS

MATERIALS

Steel members are mild open hearth steel, hot rolled or cold drawn to profiles shown on Plates. **Hardware parts are rolled or pressed steel, malleable iron or bronze.** Malleable and bronze hardware, where standard equipment, is indicated on Plates.

CONSTRUCTION

Frames are continuous from head to sill and from jamb to jamb with **corners full welded.** Standard frame section is that shown on Plates, Pages 6, and 10, except for Architectural Projected Windows, on which the section is as shown on Plate, Page 18. The Architectural section can be furnished on other Windows, if specified.

Muntins are continuous from jamb to jamb, except in Ventilators where they are continuous from head to sill, and have **no copes, cut outs or reduction in section.** Vertical muntins in fixed portions of Window and horizontal muntins in Ventilators are individual pieces, coped to fit the members to which they join. **All joints, muntin to muntin and muntin to frame, are full welded.**

WELDING of all joints and connections is continuous along contact lines both in face and depth.

Bolts used for attaching Ventilator hardware are of special design, with SAE threads and nuts.

HORIZONTALLY PIVOTED WINDOWS

HORIZONTALLY PIVOTED VENTILATORS (See Plate, Page 6), are pivoted on **pressed steel close knuckle Pivots, fitted with brass pins, 2" above center line of Ventilator.** (See Cut, Page 8). Pivots are bolted to Ventilator and are **locked and bolted** into the weathering on the fixed member of the Window.

A **Push Bar** (see Cut, Page 8), is used for Pivoted Ventilators within reach from the floor, unless otherwise specified. It consists of a **notched steel angle** and a **pressed steel hinge with rivet**, bolted off center to the Ventilator sill, with **universal movement of the angle.** Bolted to the center of the fixed member at the bottom of the opening is a **steel strike plate**, and on the Ventilator sill, bolted off center, is a **pressed steel cam action locking clip.** The **Push Bar, when in closed position, draws the Ventilator tight closed and locks it against opening.**

A **Cam Handle**, (see Cut, Page 8), is used for Ventilators out of reach, and, if specified, for Ventilators within reach. It consists of a **malleable iron cam handle**, riveted by a **brass rivet** to a **pressed steel clip**, bolted to the Ventilator sill. Bolted to the Ventilator head is a **pressed steel bracket and roller**, through which runs No. 30 **galvanized steel sash chain** with both ends attached to the Cam Handle. **Pressed steel chain clips** are furnished, fastening to the Window muntin or to the wall, permitting the Ventilator being held at any desired opening. **The Cam Handle, drawn into down position, locks the Ventilator and draws it tight closed.**

A **Spring Catch**, (see Cut, Page 8), can be used, if specified, in place of the Push Bar or Cam Handle. It consists of a **die cast body and spring actuated bolt**, bolted to the head of the Ventilator. The spring actuated bolt engages with a **pressed steel keeper** bolted to the fixed member at the top of the opening. The trigger is operated by No. 30 **galvanized steel sash chain**, which is secured for any desired opening of the Ventilator by a **chain clip**, as described above for the Cam Handle.

TOP PIVOTED VENTILATORS, (see Plate, Page 6), are similar in all respects to Horizontally Pivoted Ventilators, except that the pivot is located 4" down from the head of the Ventilator instead of 2" above the center line. The **Push Bar** (see above) is furnished with this Ventilator.

Explosion Hardware, as described below, if specified, can be furnished with this Ventilator.

BOTTOM HINGED VENTILATORS, (see Plate, Page 6), are hinged at the bottom on **heavy steel butt hinges with brass pins, welded** to the Ventilator sill and to the fixed member at the bottom of the opening. Ventilators are supported on two **steel stay arms**, swiveling on a **brass screw** on the opening side member, with slots engaging with a **steel pin** on the Ventilator jamb. The maximum opening of the Ventilator is approximately 30°. The **Spring Catch** only (see above) is furnished with this Ventilator.

COMMERCIAL PROJECTED WINDOWS

PROJECTED VENTILATORS, (see Plate, Page 10), **projected out**, slide down from the head and project out from the sill, and **projected in**, slide up from the sill and project in from the head. The sliding head or sill member is fitted at each corner with a **formed steel casing, welded** to the Ventilator, which carries a **floating bronze spring-actuated yoke**, in the head of which is a **hardened steel ball.** The yoke is slotted and acts as a guide for the Ventilator member in its travel. The side member of the opening has a **rolled steel angle**, the outstanding leg of which engages with the slot in the bronze yoke, and the edge of which contacts the hardened steel ball. The spring actuated yoke forces the ball against the toe of the angle and holds the Ventilator in any desired position. The engagement of the yoke and angle prevents side motion of the Ventilator. Scraping and abrasion of the protecting coating on the metal of the opening member is eliminated. (See Plate, Page 10.) Ventilators are balanced on two **steel arms** attached to the Ventilator by a **brass screw** and to the opening member by a **steel rivet.**

COMMERCIAL OUT PROJECTED VENTILATORS, within reach from the floor, are fitted with a **malleable iron Pole Ring**, bolted at the center of the Ventilator head, and a **malleable iron Cam Handle** as described above under Horizontally Pivoted Ventilators, bolted at the center of the sill. (See Plate, Page 10.)

Ventilators not within reach from the floor, and Ventilators where operation by pole is not satisfactory, are fitted with an **Automatic Locking Latch**, (see Cut, Page 8), bolted to the sill of the Ventilator and to the fixed member at the bottom of the opening, operated by a **chain** through a **chain roller** bolted to the head of the Ventilator. The **Automatic Locking Latch** consists of a **malleable iron body**, bolted to the fixed member at the bottom of the opening. This body carries a **malleable iron trigger lock, spring controlled**, and a **steel chain roller**, both mounted on a **steel pin.** Bolted to the sill of the Ventilator is a **malleable iron keeper.** To the head of the Ventilator is bolted a **pressed steel bracket and chain roller.** No. 30 **galvanized steel sash chain** runs from the trigger through the Ventilator head chain roller, down to and through the body chain roller, and attaches to the keeper. When closed, the Ventilator is locked.

Explosion Hardware, if specified, can be furnished with this Ventilator. This consists of a **malleable iron Cam Handle**, swiveling on a **brass rivet** which connects it to a **pressed steel clip** bolted to the Ventilator sill member. A **brass strike plate** is bolted to the fixed member at the bottom of the opening. The cam handle cam is beveled at an angle which will permit the Ventilator to open upon application of a predetermined pressure per square foot of Ventilator area.

COMMERCIAL IN PROJECTED VENTILATORS are fitted with a **malleable iron Spring Cam** (see Plate, Page 10), bolted to the head of the Ventilator. The bolt of the Spring Cam engages with a **malleable iron keeper** bolted to the fixed member at the head of the opening.

Where two Ventilators come together, sill and head, the upper projected out and the lower in, the **Cam Handle at the sill and the Spring Cam at the head** are combined into one assembly. (See Cut, Page 19.)

ARCHITECTURAL PROJECTED WINDOWS

ARCHITECTURAL IN OR OUT PROJECTED VENTILATORS have the same Hardware as described above for similar Commercial Projected Ventilators, except that Architectural Hardware is furnished in **heavy bronze**. If specified, **malleable iron** can be furnished. (See Cut, Page 19.)

UTILITY WINDOWS

UTILITY VENTILATORS, one light high commercial in projected, have **Spring Catch Hardware**. (see Plate, Page 15.)

DETENTION WINDOWS

INDUSTRIAL DETENTION WINDOWS, (see Plate, Page 13), are limited in glass size to **panes less than 160 square inches** (10" x 16"). They have either **Horizontally Pivoted or Commercial In or Out Projected Ventilators**.

For Horizontally Pivoted and Commercial Out Projected Ventilators, **malleable iron Cam Handle Hardware** is standard. For Commercial In Projected Ventilators, **malleable iron Spring Cam Hardware** is used. Hardware can be furnished in **bronze**, if specified.

PROTECTION WINDOWS, (see Plate, Page 14), consist of a fixed frame, with **glass sizes not over 8' x 11'**, superimposed on and **welded** to which, either on the inside or outside, is a completely ventilated Window unit. The Ventilator if **outside**, is **Commercial Out Projected**, if **inside** may be either **Bottom Hinged Swing In or Commercial In Projected**. Commercial In Projected Ventilators are **limited in the degree of opening** by a limit stop. The fixed frame of the Window forms a **grille** over the Ventilator.

Ventilators are glazed with a single pane where less than ten lights in the Window frame are covered by the Ventilator. The lights in the frame covered by the Ventilator are not glazed.

Hardware for **outside** Ventilator, is **malleable iron Cam Handle or Automatic Locking Latch** (see Commercial Out Projected Ventilators, Page 3), for **inside** Ventilator is a **Spring Catch**, bolted to the head of the Ventilator. **Bronze** Hardware can be furnished, if specified.

Windows can be **putty glazed** with glass either on the **inside or outside** of the face of the Window, as specified.

SECURITY WINDOWS are in all respects similar to Protection Windows, except that the **glass size** of the frame is **6" x 18"** and of the Ventilator **12" x 18"**.

[CURVED HEAD WINDOWS

CURVED HEADS (see Plate, Page 11), are separate units. Where one Window only is used below the curved head the curved head attaches directly to the Window below. Where more than one Window is used below the curved head a Horizontal Mullion (see Plate, Page 11), is used.

CAMBERED AND SPLAYED HEADS. Windows may have Cambered or Splayed Heads where required. (See Plate, Page 11.)

UNDERWRITERS' LABELED WINDOWS

LABELED WINDOWS, (see Plate, Page 7), are made in accordance with the requirements of the **Underwriters' Laboratories, Inc.** All panes are fitted with **$\frac{9}{16}$ " x $\frac{9}{16}$ " x $\frac{1}{16}$ " formed metal Glazing Angles**, continuous around the pane and attached to the Window members with **steel or brass screws and bolts**, as specified, except that **outside glazed Protection and Security Windows** have **Glazing Angles on Ventilators only**. **Pressed steel Expansion Locks** are fitted to each corner of the Ventilator. **Underwriters' Windows** have the **Underwriters' Label** attached by the Laboratories Representative, after inspection at the Factory.

Horizontally Pivoted Ventilator Hardware is a **Cam Latch**, described above, with a **Fusible Link** in the chain.

Top Pivoted Ventilators have a **Push Bar** described above.

Bottom Hinged Ventilators have **Spring Catch Hardware**.

Commercial Out Projected Ventilators have **Cam Handle Hardware, In Projected, Spring Cam or Spring Catch**.

Architectural Projected Windows cannot be furnished with the **Underwriters' Label**.

GLAZING ANGLE WINDOWS

GLAZING ANGLE WINDOWS, similar in all respects to Underwriters' Labeled Windows, except **not having the Expansion Locks, Label and Link**, are furnished, when specified, with any type of Ventilator.

Architectural Projected Windows are fitted with **Glazing Angles**, as standard construction. Angles can be omitted, if specified.

DOUBLE GLAZED WINDOWS

DOUBLE GLAZED WINDOWS, (see Plate, Page 6), providing for **$\frac{1}{4}$ " air space** between panes, can be furnished, if specified, equipped with **Glazing Angles** and **pressed steel Spacers**.

MULLIONS

VERTICAL MULLIONS, (see Plate, Page 6), except for Utility Windows, consist of **two steel angles** and a **steel plate**, assembled in place by **carriage bolts** and **pressed steel yokes** spaced 12" on center. The square shank of the bolt engages a square hole in the plate, locking the bolt against turning. The angles are held in position by the yokes, through which the bolts pass. The Mullion is **adjustable both vertically and horizontally**. For Windows six lights or more high, the two angles are replaced by **two steel channels**. Mullions project 2" into the sill for anchorage.

Utility Window Mullions consist of a plate, carriage bolts and clips. (See Plate, Page 15). The square shank of the carriage bolt engaged by a square hole in the plate, locks the bolt against turning. The Mullion is **adjustable both vertically and horizontally**.

HORIZONTAL MULLIONS, (see Plate, Page 11), are of various designs, depending on the width of the Window opening. They are built up of **rolled steel shapes**, welded together. Where set in masonry, 4" is allowed at each end for bearing, and where used with steel framing, proper connections are provided. (Where used with steel, Horizontal Mullions should be included under Structural Steel or Miscellaneous Iron contract).

Cover Plates, (see Plates, Pages 10 and 11), for inside face of Mullions, either vertical or horizontal, except for Mullions for Utility Windows, are furnished, if specified.

JAMB PLATES

Rolled steel bars, (see Plate, Page 16), continuous from head to sill, **welded** or bolted to jambs of Windows, are furnished, if specified.

CLIPS AND ANCHORS

Pressed steel Clips and Anchors, (see Plate, Page 16), for attaching Windows to surrounding wall structure, are furnished with bolts.

Spring wire copper coated Glazing Clips, are furnished with all **putty glazed** Windows.

Shade Bracket holes, tapped or drilled, are provided, if specified.

Window Cleaner Anchors are furnished, if specified.

HOT GALVANIZING OR RUST PROOFING

Windows are **hot dip galvanized** or otherwise **rust proofed**, **after fabrication** and before installing, if specified.

PAINT

Windows are given **one shop coat of grey mineral oxide paint** at the Factory before shipment.

SCREENS

See Screen Specification, Page 23.

MECHANICAL OPERATORS

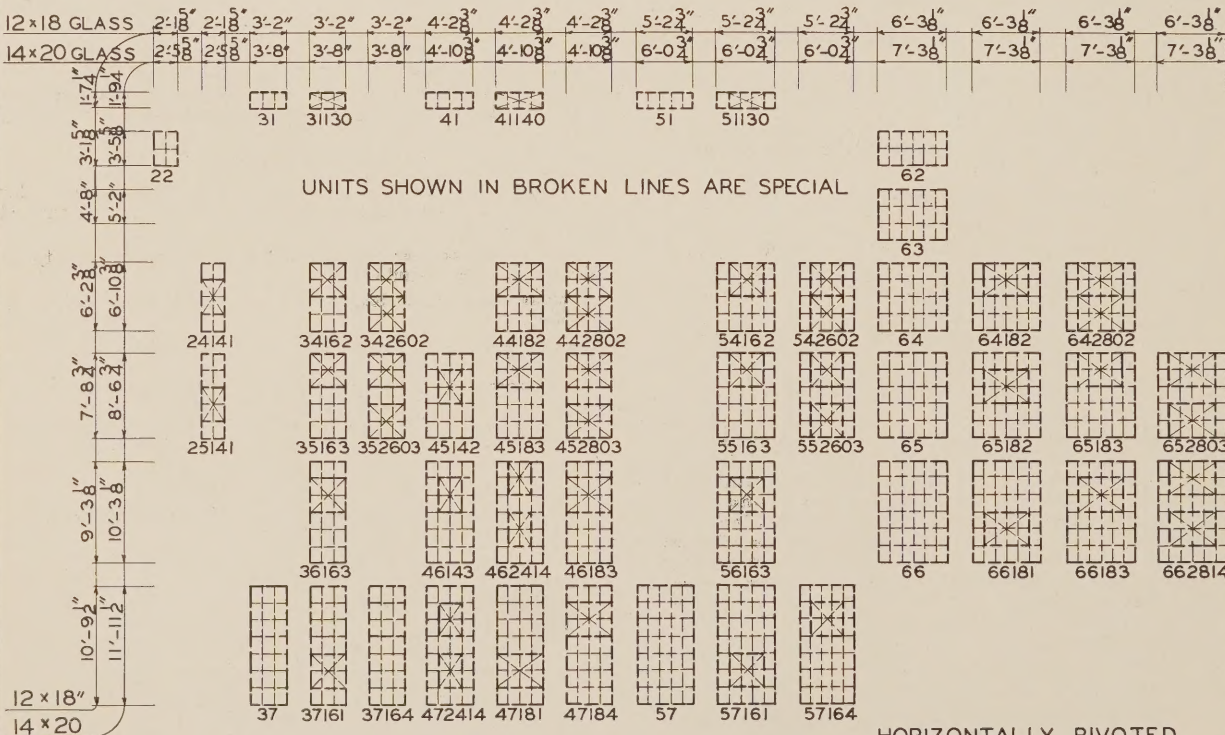
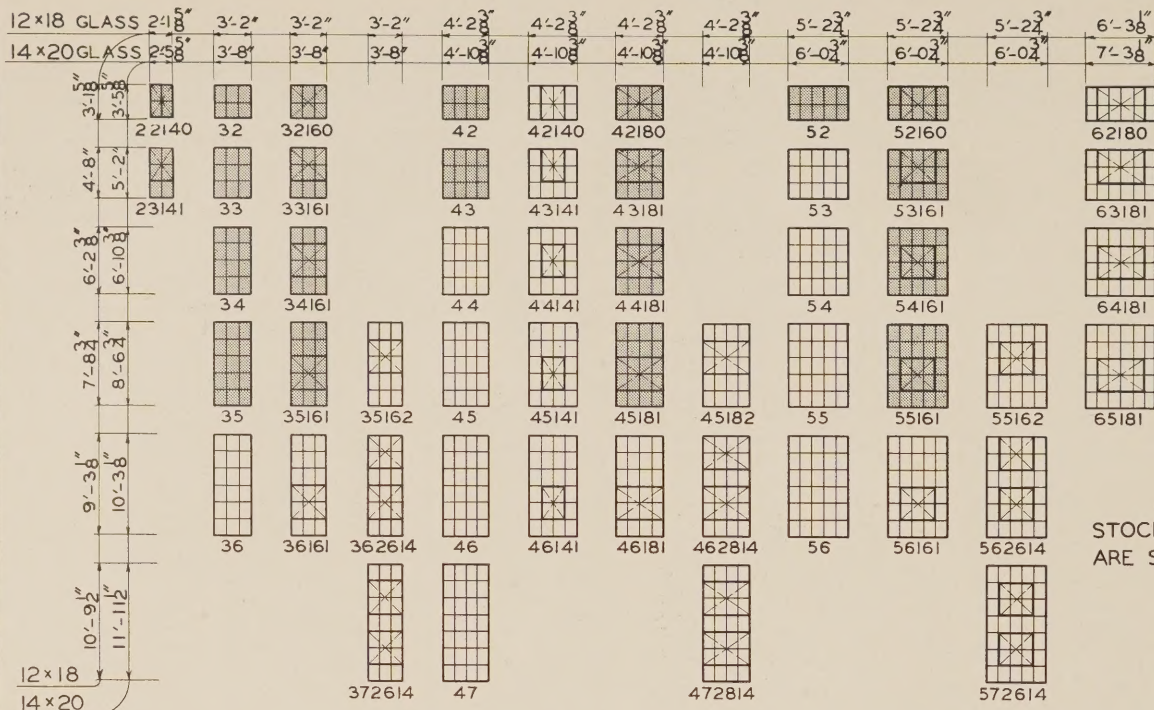
See Mechanical Operator Specification, Page 27.

INSTALLATION

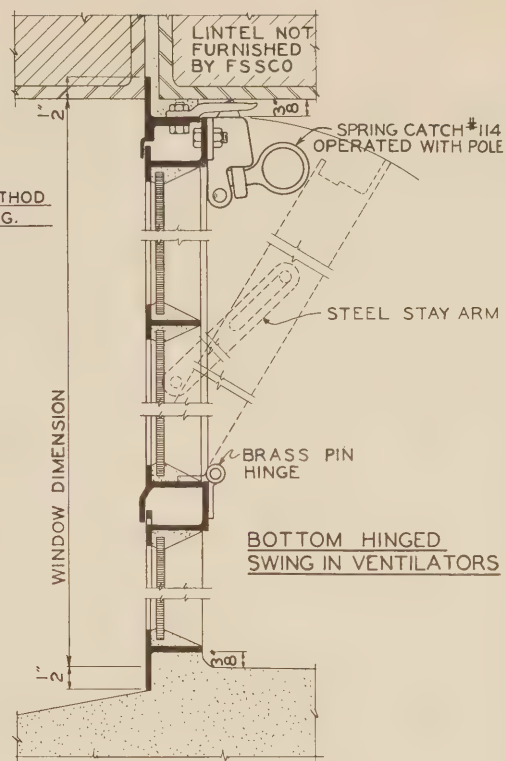
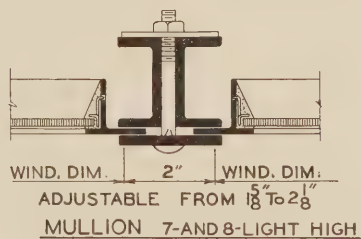
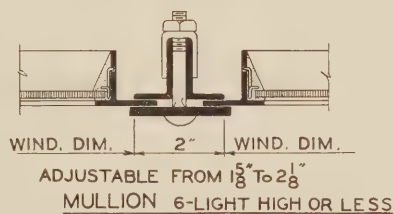
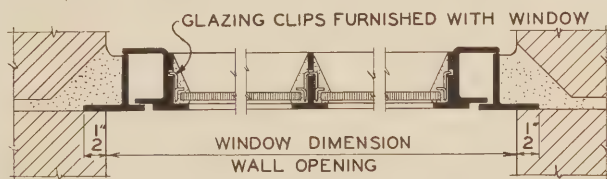
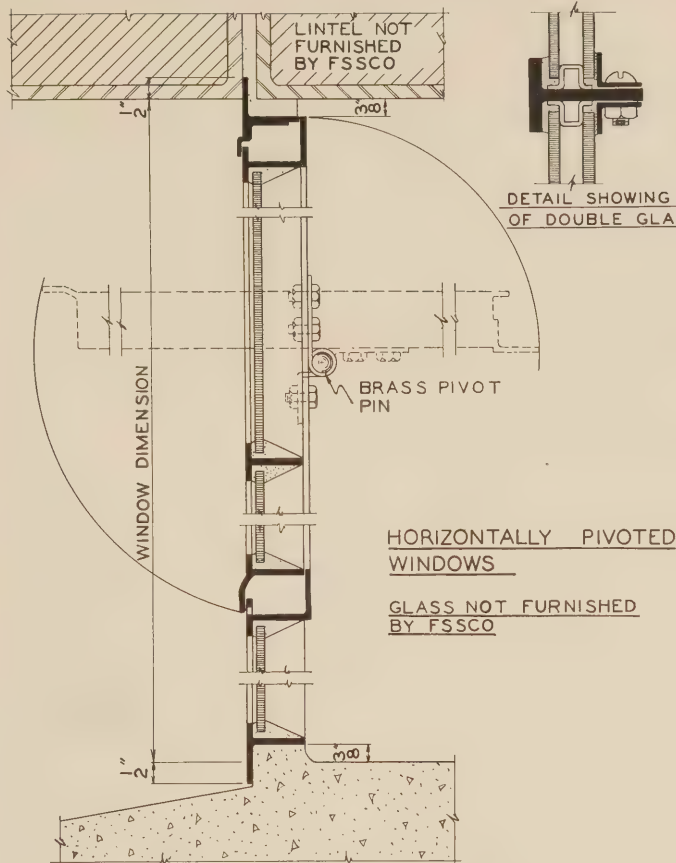
See Installation Specification, Page 34.

GLASS AND GLAZING

Glass and Glazing do not come under the Window Specification.



HORIZONTALLY PIVOTED
FEDERAL
 WELDED SOLID STEEL
 WINDOWS



12	11	12	11	12
18	17	17	17	18
12	11	12	11	12
18	17	17	17	18
12	11	12	11	12
18	17	17	17	18

12 x 18 GLASS

14	13	14	13	14
20	19	19	19	20
14	13	14	13	14
20	19	19	19	20
14	13	14	13	14
20	19	19	19	20

14 x 20 GLASS

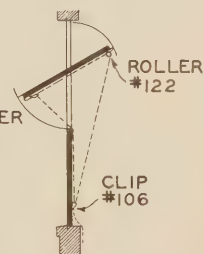
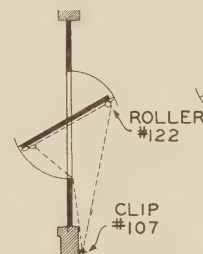
GLASS SIZES FOR
BOTTOM HINGED SWING IN VENTILATORS

12	11	12	11	12
18	16	16	16	18

12 x 18 GLASS

14	13	14	13	14
20	18	18	18	20

14 x 20 GLASS



HORIZONTALLY PIVOTED

FEDERAL
WELDED SOLID STEEL
WINDOWS

SCALE 3"=1'-0"

I-36

UNDERWRITERS LABELED WINDOWS

THE FOLLOWING APPLYS TO PIVOTED AND COMMERCIAL PROJECTED WINDOWS

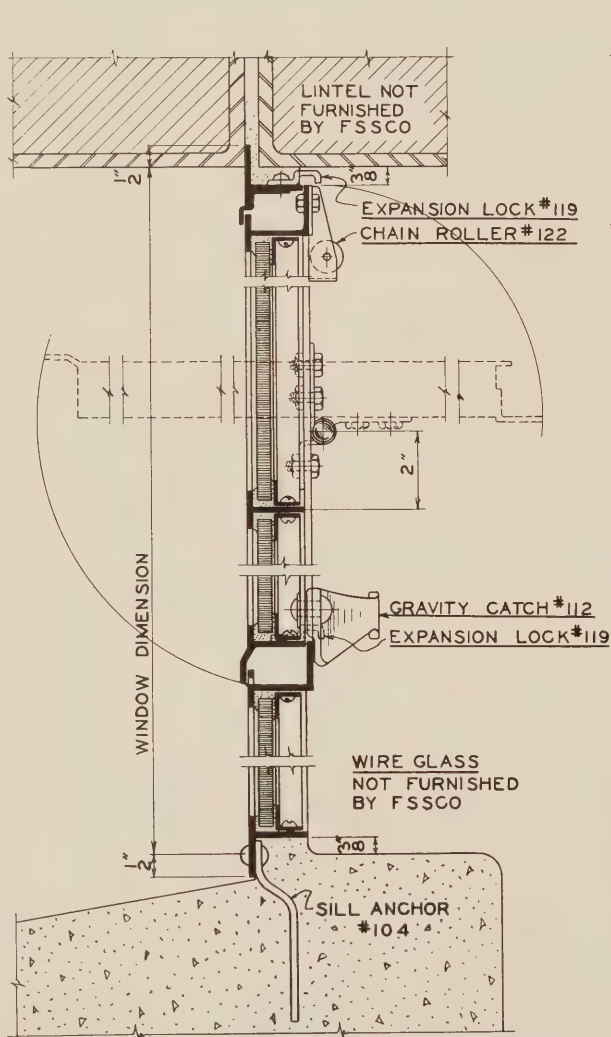
WINDOW UNITS FOR SINGLE UNIT OPENINGS MUST NOT EXCEED 8'-6" IN WIDTH OR 12'-0" IN HEIGHT; BUT IN NO CASE SHALL THE AREA EXCEED 75 SQUARE FEET FOR A VENTILATED UNIT AND 80 SQUARE FEET FOR A FIXED UNIT.

UNITS IN MULTIPLE OPENINGS MUST NOT EXCEED 7'-0" IN WIDTH.

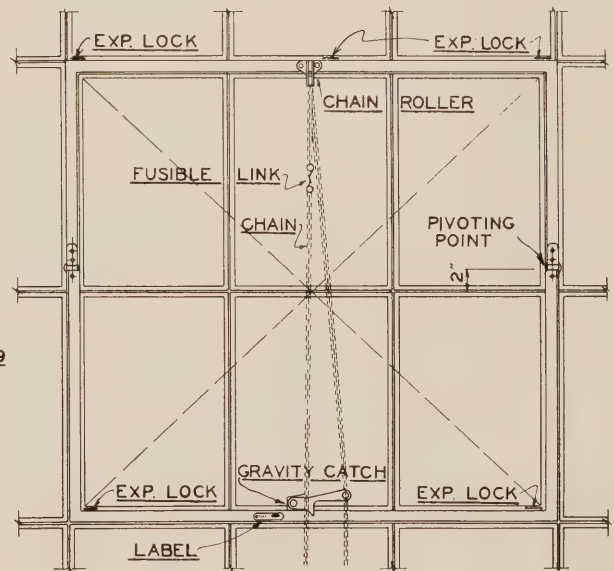
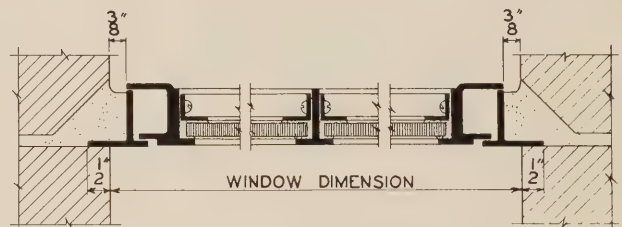
GLASS LIGHTS ARE LIMITED TO A MAXIMUM EXPOSED GLASS AREA OF 350 SQUARE INCHES.

THE TOTAL VENTILATED AREA IN ANY SINGLE WINDOW UNIT IS LIMITED TO 40 SQUARE FEET (5,760 SQUARE INCHES) OF EXPOSED GLASS AREA, AND NOT MORE THAN THREE VENTS ARE PERMITTED PER WINDOW UNIT.

VENTILATORS MAY BE HORIZONTALLY PIVOTED NEAR CENTER OR NEAR TOP TO OPEN OUT AT BOTTOM.



COMMERCIAL PROJECTED UNDERWRITERS LABELED WINDOW DETAILS SIMILAR TO ABOVE



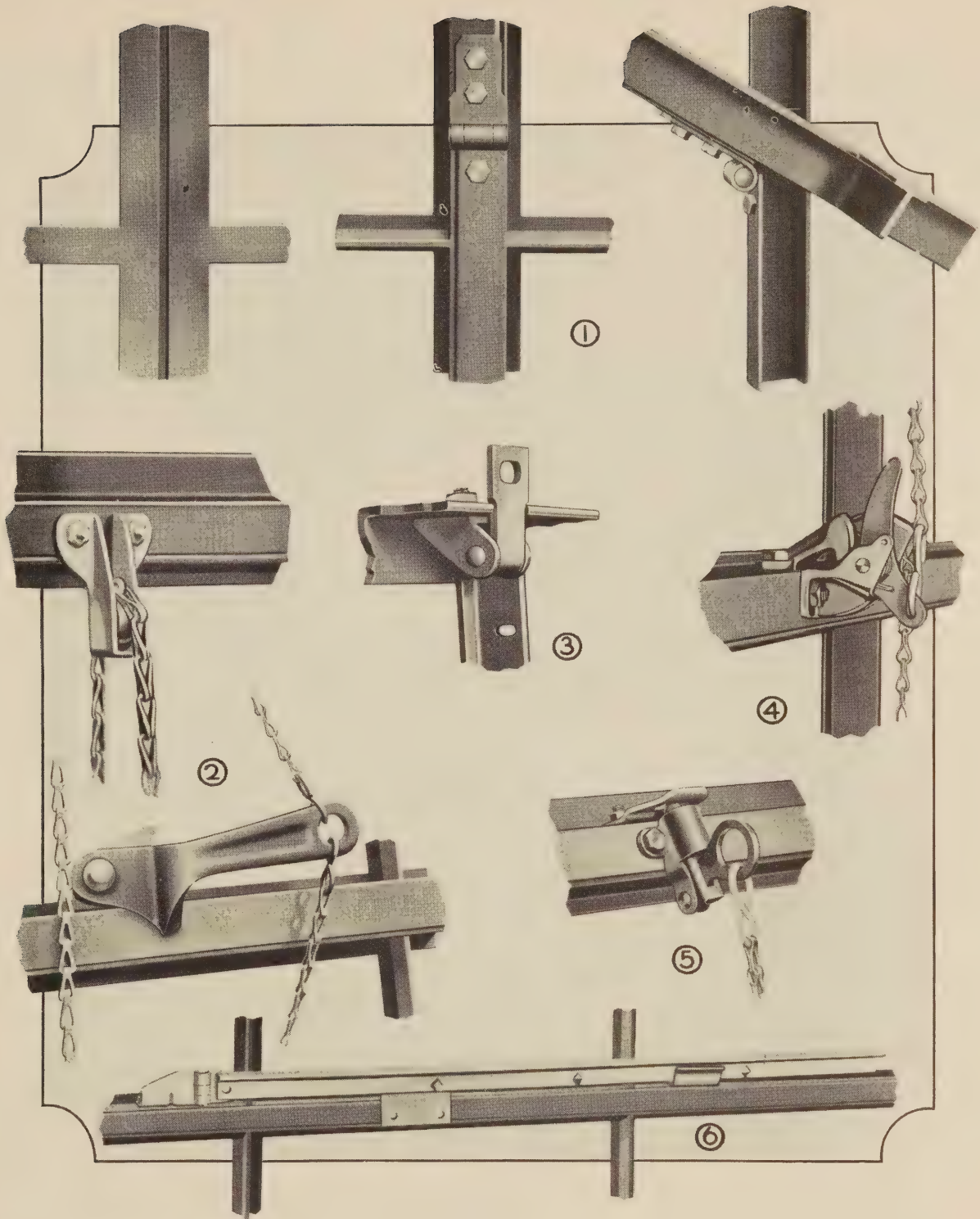
INSIDE ELEVATION OF VENTILATOR



UNDERWRITERS
FEDERAL
WELDED SOLID STEEL
WINDOWS

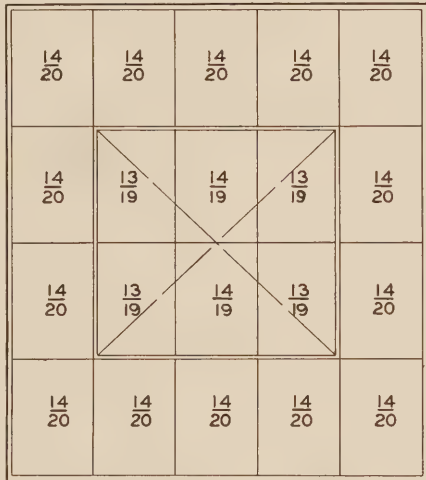
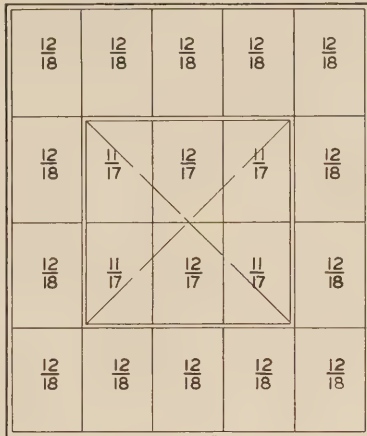
SCALE 3/4"=1'-0"

I-36

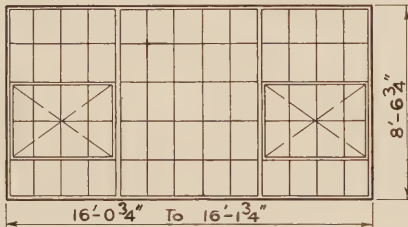


- 1—Close Knuckle Pivot. (See Page 3.)
- 2—Cam Handle and Chain Roller. (See Page 3.)
- 3—Hinge for Continuous Window. (See Page 25.)
- 4—Automatic Locking Latch and Keeper. (See Page 3.)
- 5—Spring Catch and Keeper. (See Page 3.)
- 6—Push Bar. (See Page 3.)





GLASS SIZES



COMPUTING WALL OPENING

$$\begin{aligned}
 \text{I-UNIT 45181} - 14\frac{1}{20} &= 4'-10\frac{3}{8}'' \\
 \text{I-MULLION} &= 2'' \left(15\frac{1}{8}'' \text{ to } 21''\right) \\
 \text{I-UNIT 55} - 14\frac{1}{20} &= 6'-0\frac{3}{4}'' \\
 \text{I-MULLION} &= 2'' \left(15\frac{1}{8}'' \text{ to } 21''\right) \\
 \text{I-UNIT 45181} - 14\frac{1}{20} &= 4'-10\frac{3}{8}'' \\
 \text{TOTAL} &= 16'-12'' \left(16'-0\frac{3}{4}'' \text{ to } 16'-1\frac{3}{4}''\right)
 \end{aligned}$$

FOR HORIZONTALLY PIVOTED AND
COMMERCIAL PROJECTED WINDOWS

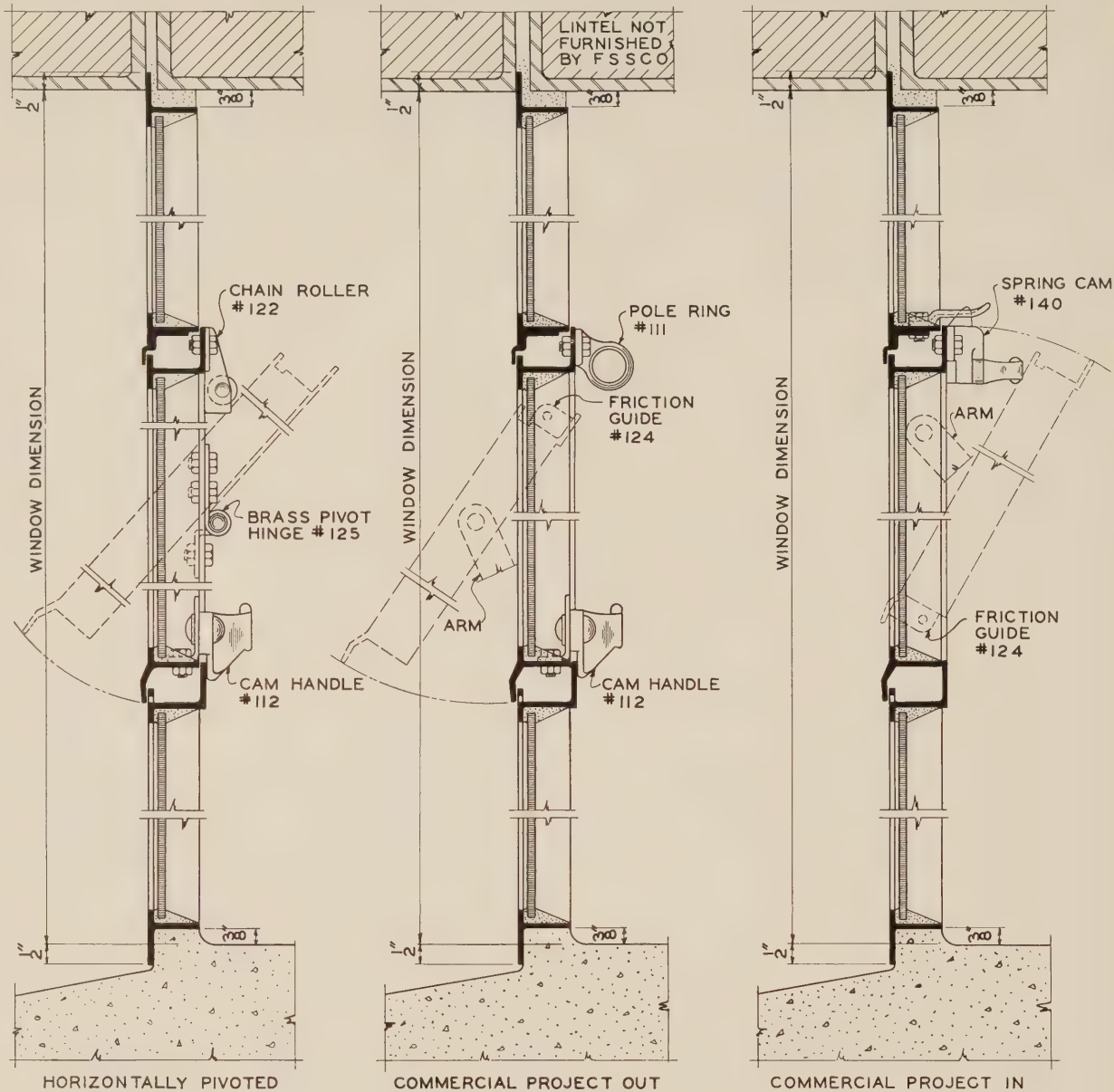
TABLE OF SYMMETRICAL COMBINATIONS

12×18 Height of Opening	Lights High	14×20 Height of Opening	Number of Lights in Width of Opening	Number of Units To Fill Opening	Number of Lights in Each Unit and Number Units to Fill Opening
1'-7¼"	1	1'-9¼"			
3'-1⅝"	2	3'-5⅝"			
4'-8"	3	5'-2"			
6'-2⅜"	4	6'-10⅜"			
7'-8¾"	5	8'-6¾"			
9'-3⅛"	6	10'-3⅛"			
10'-9½"	7	11'-11½"			
Width of Opening					
12×18	14×20				
2'-1⅝"	2'-5⅝"	2	1	2	
3'-2"	3'-8"	3	1	3	
4'-2⅜"	4'-10⅜"	4	1	4	
4'-5¼"	5'-1¼"	4	2	2, 2	
5'-2¾"	6'-0¾"	5	1	5	
6'-3⅛"	7'-3⅛"	6	1	6	
6'-6"	7'-6"	6	2	3, 3	
7'-6⅜"	8'-8⅜"	7	2	4, 3	
8'-6¾"	9'-10¾"	8	2	4, 4	
9'-10"	11'-4"	9	3	3, 3, 3	
10'-7½"	12'-3½"	10	2	5, 5	
10'-10⅜"	12'-6⅜"	10	3	3, 4, 3	
11'-10¾"	13'-8¾"	11	3	3, 5, 3	
11'-10¾"	13'-8¾"	11	3	4, 3, 4	
12'-8¼"	14'-8¼"	12	2	6, 6	
12'-11⅝"	14'-11⅝"	12	3	4, 4, 4	
13'-2"	15'-2"	12	4	3, 3, 3, 3	
13'-11½"	16'-1½"	13	3	4, 5, 4	
13'-11½"	16'-1½"	13	3	5, 3, 5	
14'-11⅝"	17'-3⅞"	14	3	4, 6, 4	
14'-11⅝"	17'-3⅞"	14	3	5, 4, 5	
15'-2¾"	17'-6¾"	14	4	3, 4, 4, 3	
16'-0¼"	18'-6¼"	15	3	5, 5, 5	
16'-0¼"	18'-6¼"	15	3	6, 3, 6	
16'-6"	19'-0"	15	5	3, 3, 3, 3, 3	
17'-0⅝"	19'-8⅝"	16	3	5, 6, 5	
17'-0⅝"	19'-8⅝"	16	3	6, 4, 6	
17'-3½"	19'-11½"	16	4	4, 4, 4, 4	
17'-3½"	19'-11½"	16	4	3, 5, 5, 3	
17'-6⅜"	20'-2⅜"	16	5	3, 3, 4, 3, 3	
18'-1"	20'-11"	17	3	6, 5, 6	
18'-6¾"	21'-4¾"	17	5	3, 4, 3, 4, 3	
19'-1⅜"	22'-1⅜"	18	3	6, 6, 6	
19'-4¼"	22'-4¼"	18	4	3, 6, 6, 3	
19'-4¼"	22'-4¼"	18	4	4, 5, 5, 4	
19'-7⅞"	22' 7⅞"	18	5	3, 4, 4, 4, 3	
20'-7½"	23'-9½"	19	5	3, 5, 3, 5, 3	
21'-5"	24'-9"	20	4	5, 5, 5, 5	
21'-5"	24'-9"	20	4	4, 6, 6, 4	
21'-7⅞"	24'-11⅞"	20	5	4, 4, 4, 4, 4	
21'-10¾"	25'-2¾"	20	6	3, 3, 4, 4, 3, 3	

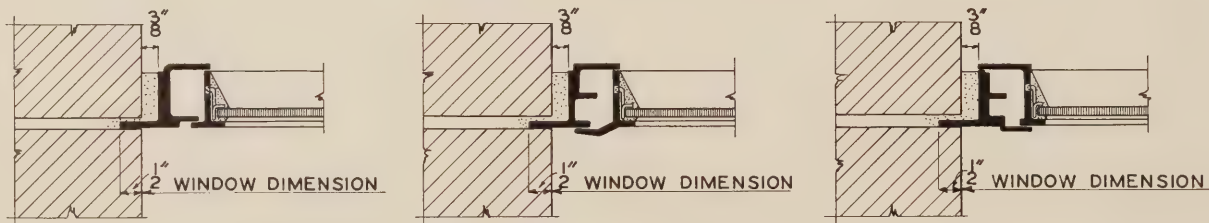
GLASS SIZES-COMBINATIONS

FEDERAL
WELDED SOLID STEEL
WINDOWS

1-36



VERTICAL SECTIONS



HORIZONTAL SECTIONS

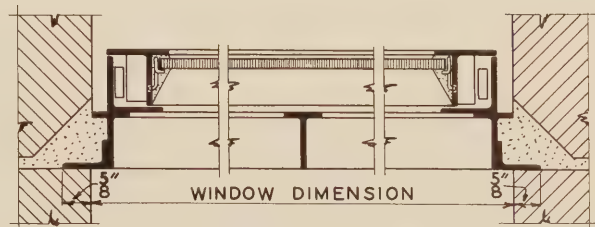
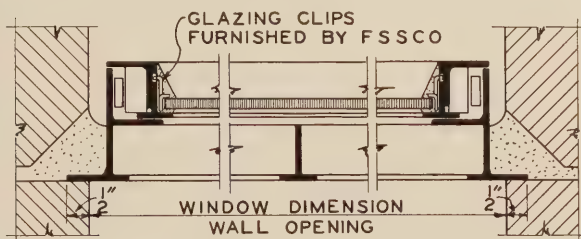
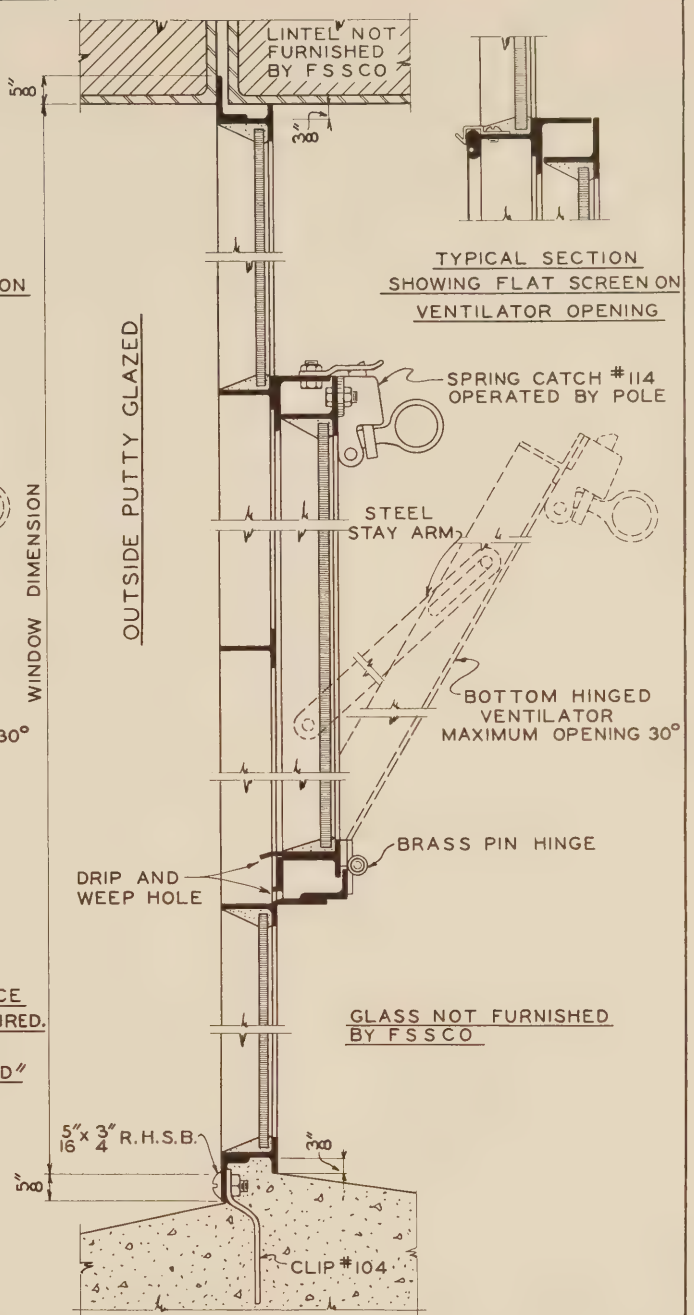
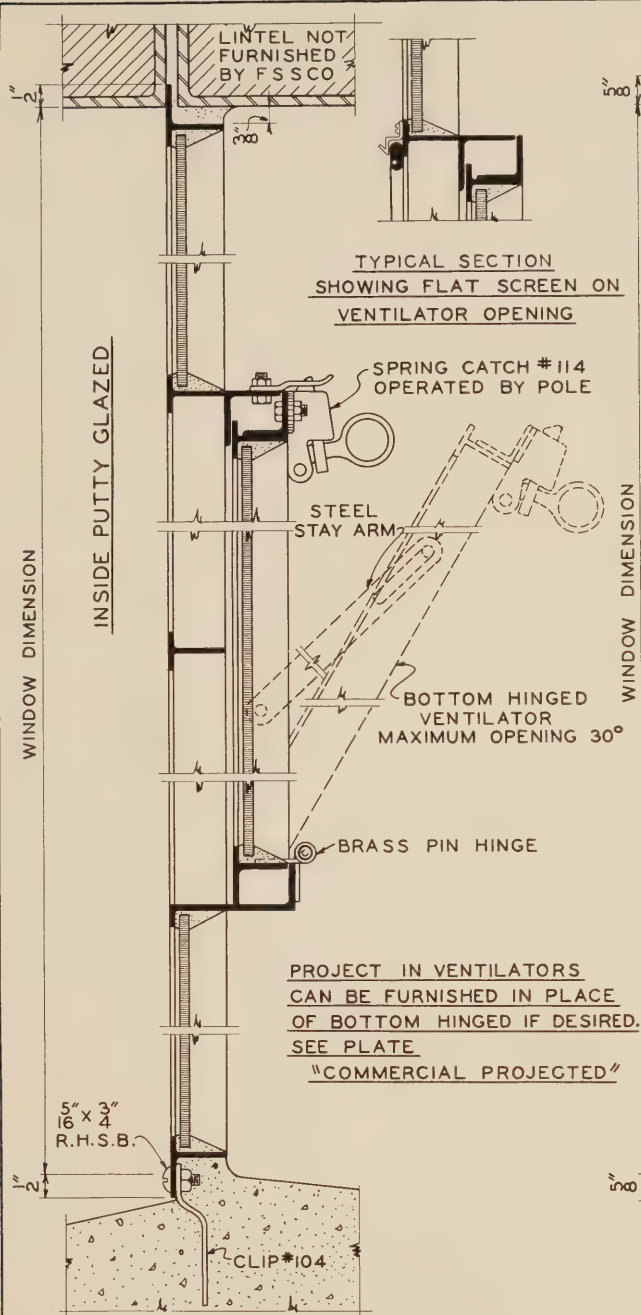
MULLIONS, SEE PLATES "HORIZONTAL PIVOTED" AND "CURVED HEADS—HORIZONTAL MULLIONS"

GLASS NOT FURNISHED BY FSSCO

SCALE 3"=1'-0"

INDUSTRIAL DETENTION
FEDERAL
 WELDED SOLID STEEL
WINDOWS

I-36

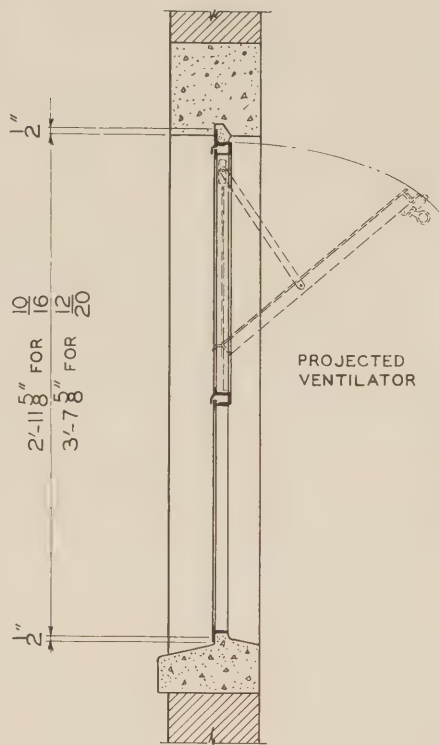


MULLIONS, SEE PLATES "HORIZONTAL PIVOTED" AND "CURVED HEADS—HORIZONTAL MULLIONS"

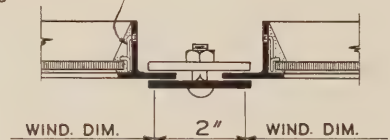
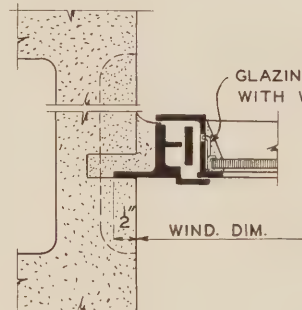
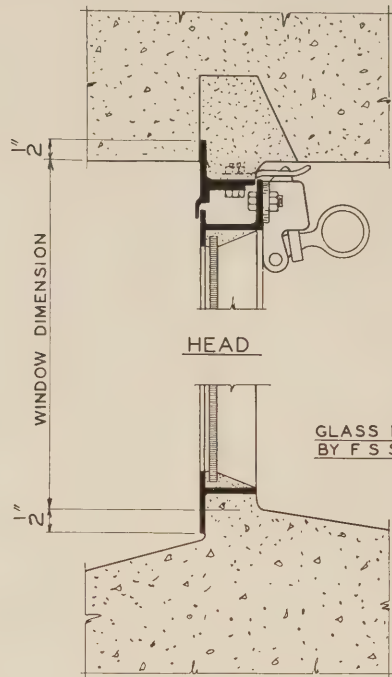
SCALE 3" = 1'-0"

SECURITY AND PROTECTION
FEDERAL
WELDED SOLID STEEL
WINDOWS

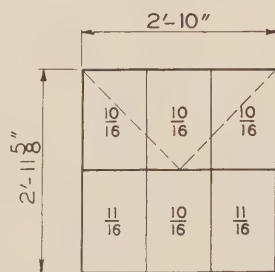
1-36



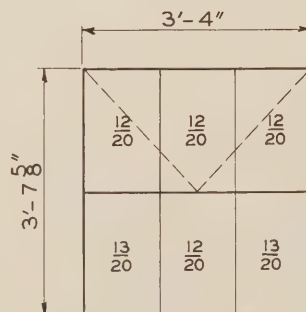
SECTION



MULLION
ADJUSTABLE FROM
18" TO 28"



32-131



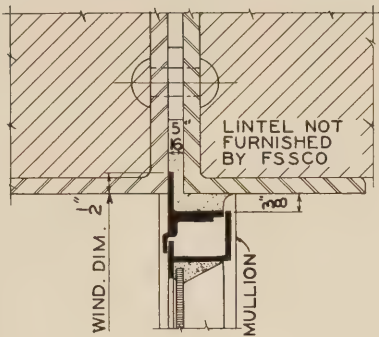
32-131

FOR OTHER INSTALLATION DETAILS
SEE "INSTALLATION DETAILS"
UNDER PIVOTED WINDOWS.

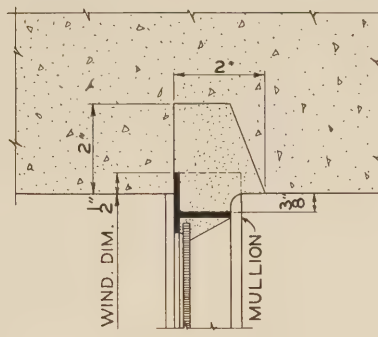
UTILITY
FEDERAL
WELDED SOLID STEEL
WINDOWS

SCALE 3"=1'-0"

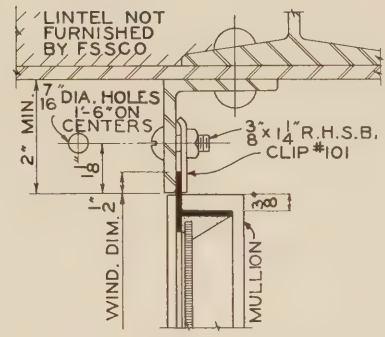
I-36



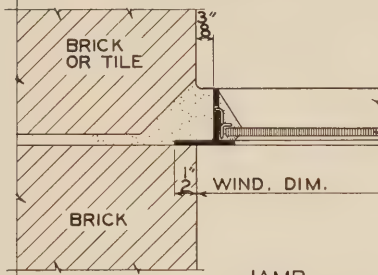
HEAD-STEEL LINTEL



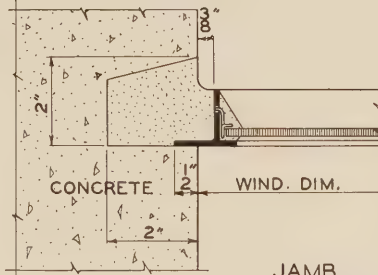
HEAD-CONCRETE



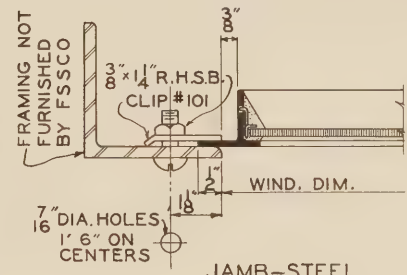
HEAD-STEEL GIRT OR LINTEL



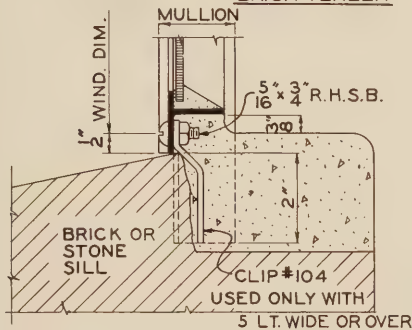
JAMB
BRICK OR
BRICK VENEER



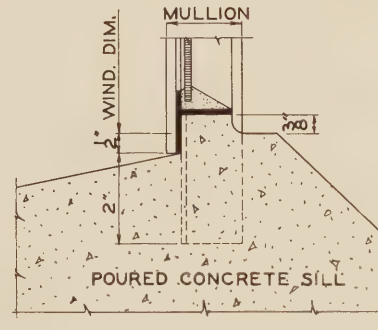
JAMB
CONCRETE



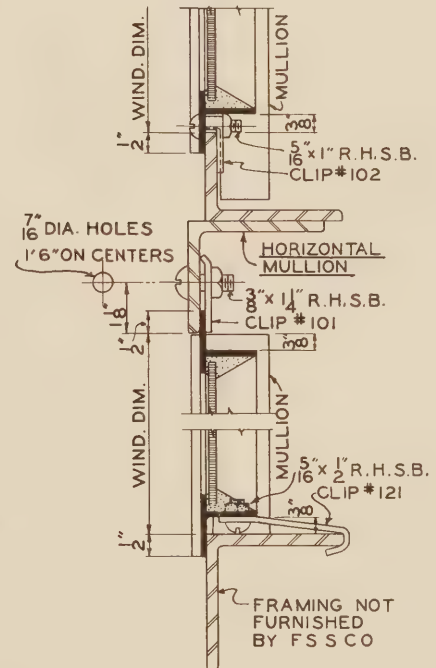
JAMB-STEEL



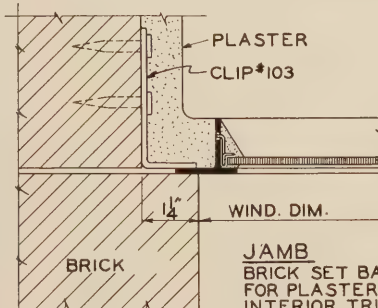
BRICK



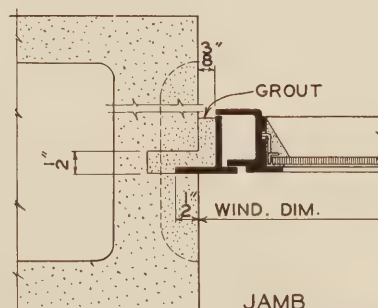
CONCRETE



STEEL GIRT



JAMB
BRICK SET BACK
FOR PLASTER OR
INTERIOR TRIM



JAMB
CEMENT BLOCK
SPECIAL GROOVED
OR STANDARD



JAMB PLATE

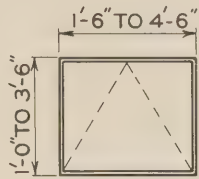
FOR HORIZONTAL PIVOTED
COMMERCIAL PROJECTED
DETENTION AND UTILITY WINDOWS

SCALE 3"=1'-0"

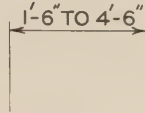
INSTALLATION DETAILS

**FEDERAL
WELDED SOLID STEEL
WINDOWS**

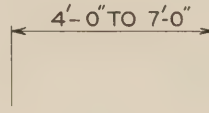
I-36



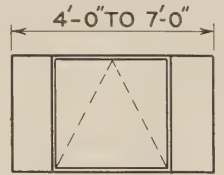
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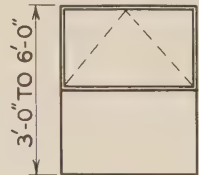
B



C



D



E



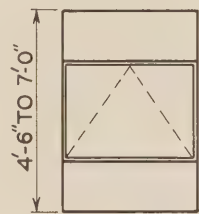
F



G



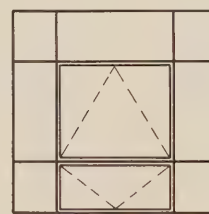
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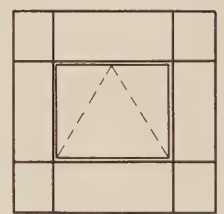
I



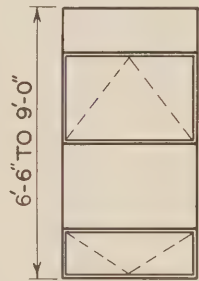
J



K



L



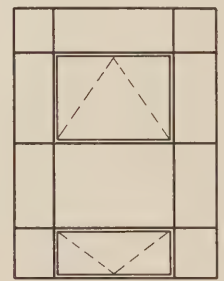
M



N



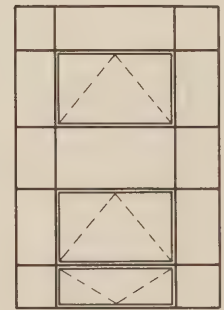
O



P



Q

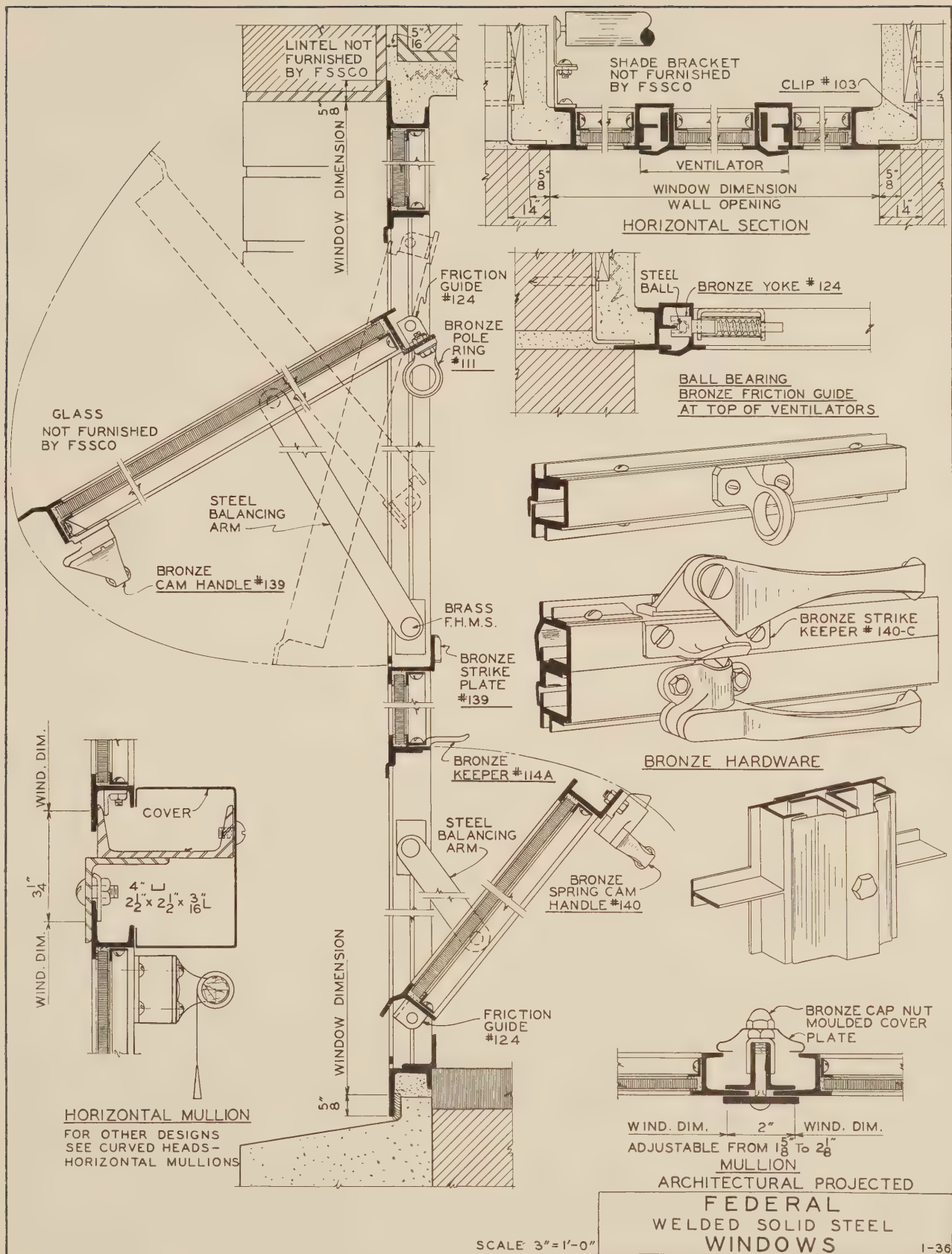


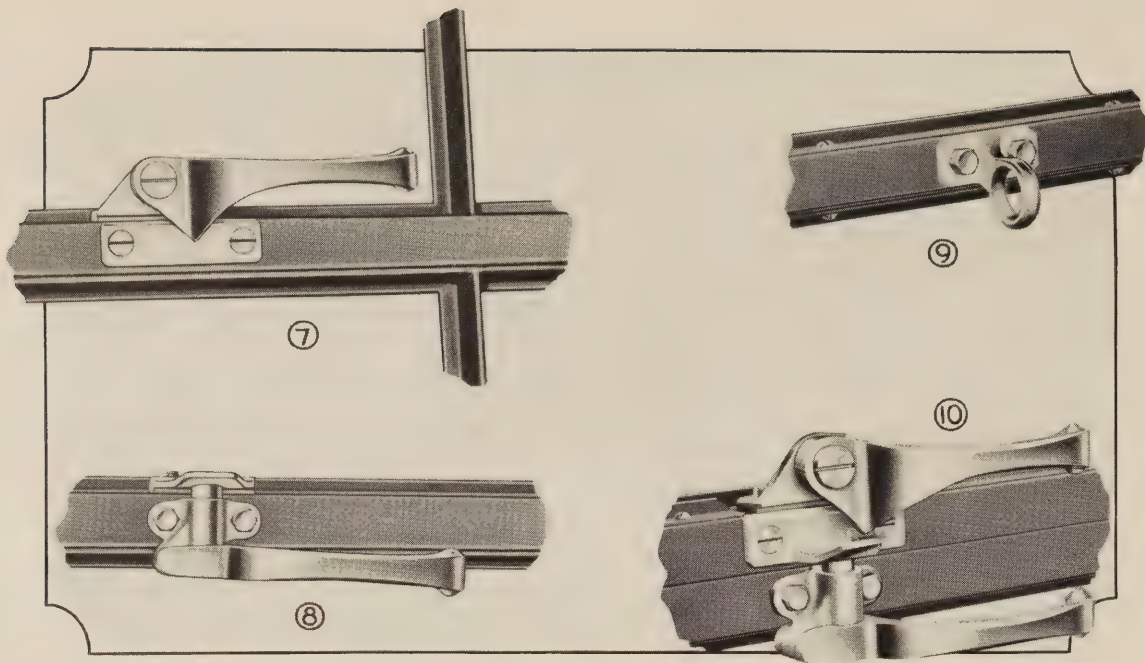
R

DIMENSIONS SHOWN ARE INCLUSIVE.
WINDOWS INCREASE IN BOTH WIDTH AND HEIGHT
BY 6 INCH INCREMENTS.
VENTILATORS MAY PROJECT EITHER IN OR OUT
AS DESIRED.

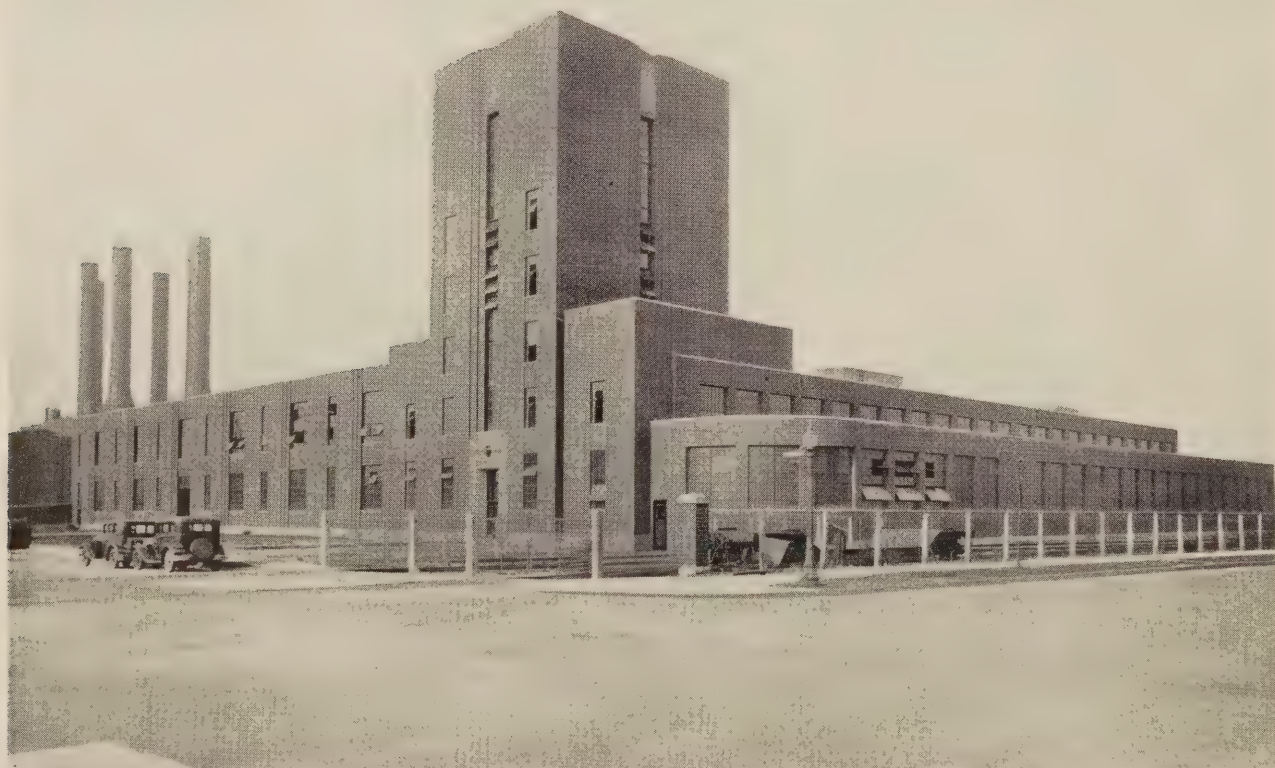
ARCHITECTURAL PROJECTED
FEDERAL
WELDED SOLID STEEL
WINDOWS

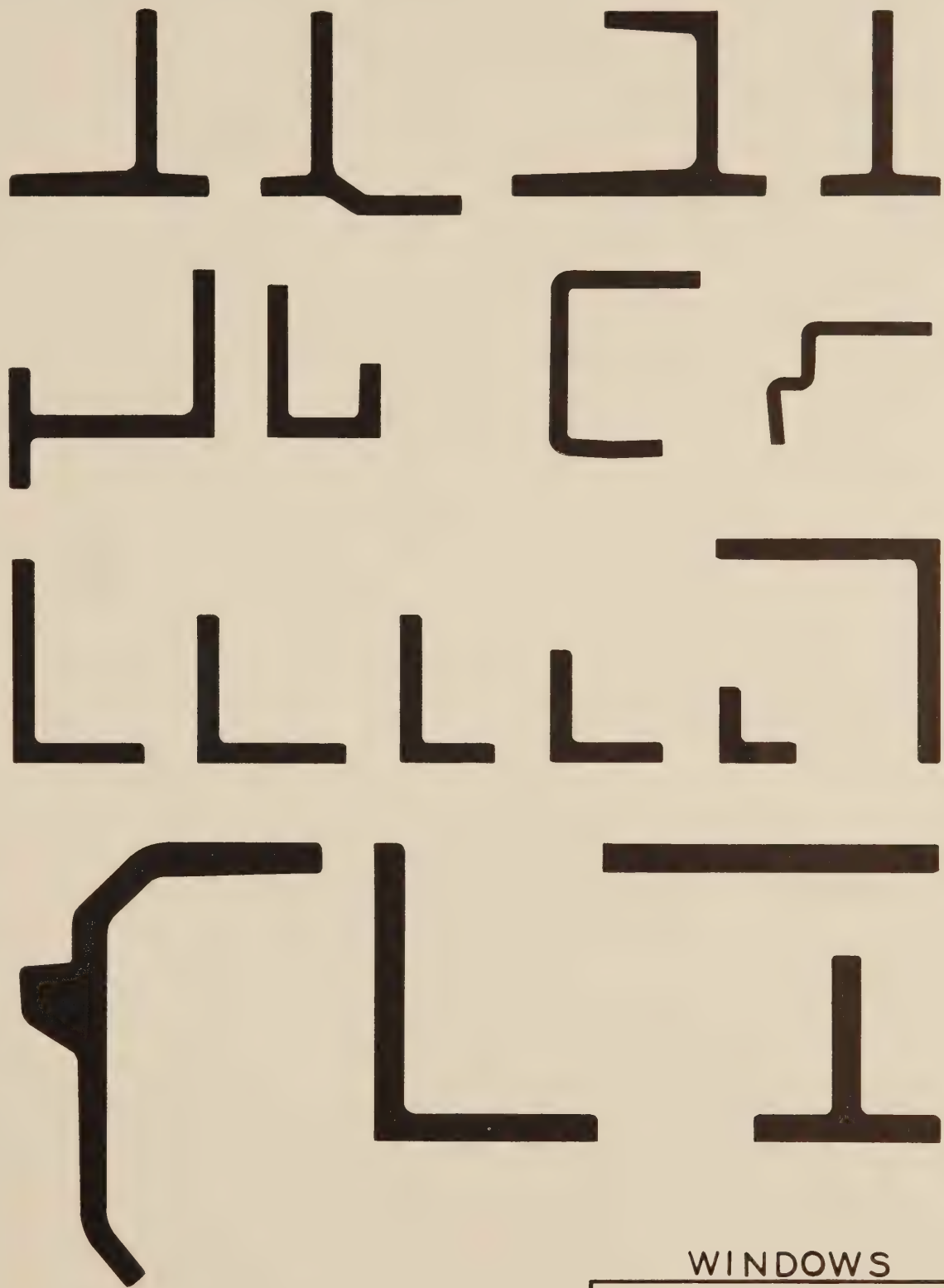
1-36





- 7—Cam Handle and Strike Plate. (See Page 3.)
 8—Spring Cam and Keeper. (See Page 3.)
 9—Pole Ring. (See Page 3.)
 10—Combined Cam Handle and Spring Cam. (See Page 4.)





WINDOWS
FULL SIZE SECTIONS

SPECIFICATIONS

FOR

BASEMENT WINDOWS

MATERIALS

All material is **mild open hearth steel**, hot rolled to profiles shown on Page 22.

CONSTRUCTION

The **Frame** head, sill and jamb members are continuous, with **joints and connections full welded, continuous along contact lines both in face and depth.** Sill member is a channel section, permitting setting of the Window in the wall opening without bracing. Jambs have **guide angles**, providing a masonry guide and to which Screens attach.

VENTILATORS

Ventilators have continuous head, sill and jamb sections, with vertical muntins cut to fit members to which they join. **All joints and connections are full welded.** Single weathering contact is provided at head and jambs and double contact at sill of Ventilator.

Ventilators are **pivoted at the sill**, the pivoting arrangement being covered by U. S. Patents. Ventilators open and remain fixed in position at **45° and 90°** and are **removable** from and **interchangeable** in Frames.

Glazing is on the **inside by putty and spring wire copper coated Glazing Clips**, which are furnished with the Window.

HARDWARE

Hardware consists of a **formed steel Locking Handle** riveted

to the head of the Ventilator and engaging with a projection in the Frame head. **When in closed position, the Handle locks the Ventilator in the Frame.**

HOT GALVANIZING

Windows are **hot dipped galvanized after fabrication** and before shipment, if specified.

PAINT

Windows are given **one dip coat of grey mineral oxide paint** at the Factory before shipment.

SCREENS

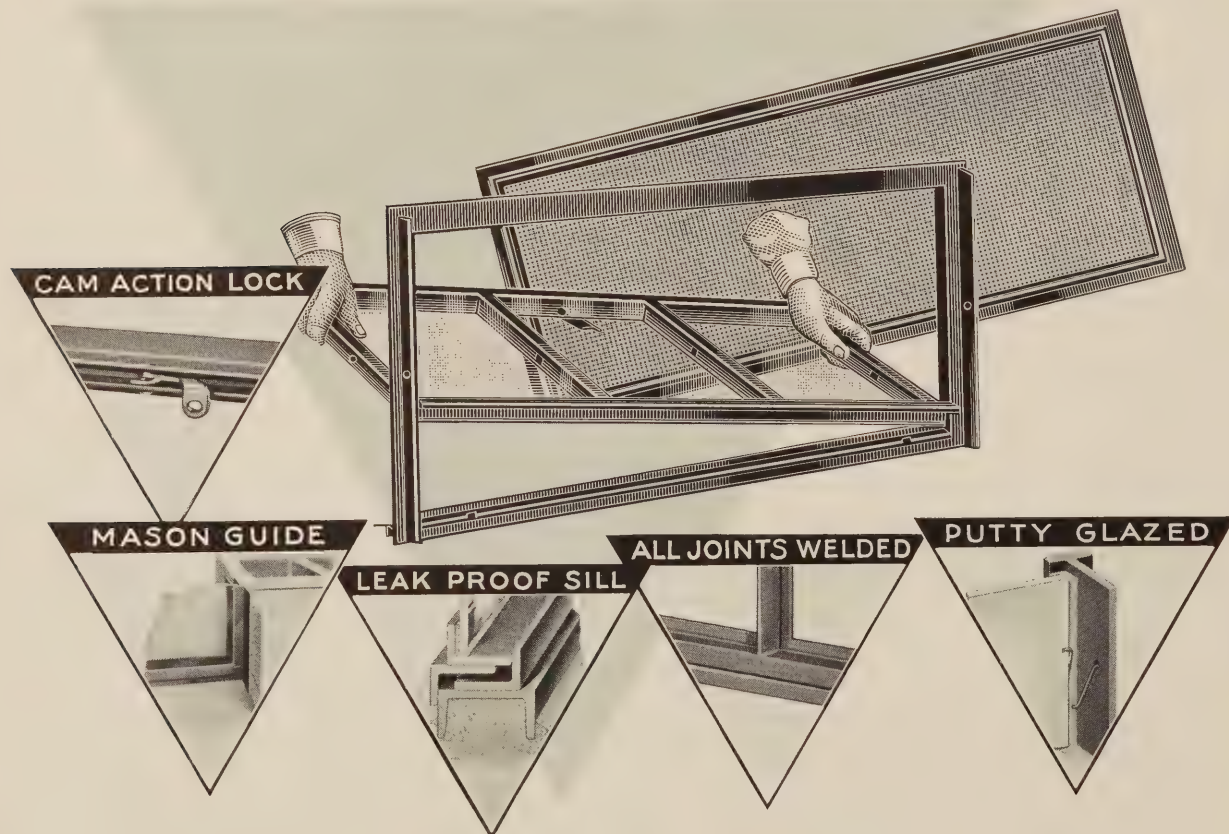
Screens are furnished, if specified. They have a **formed metal frame welded** at the corners. **Screen cloth is 16 mesh copper wire**, held in the frame by a **coppered wire spline.** Screens are **rewireable.**

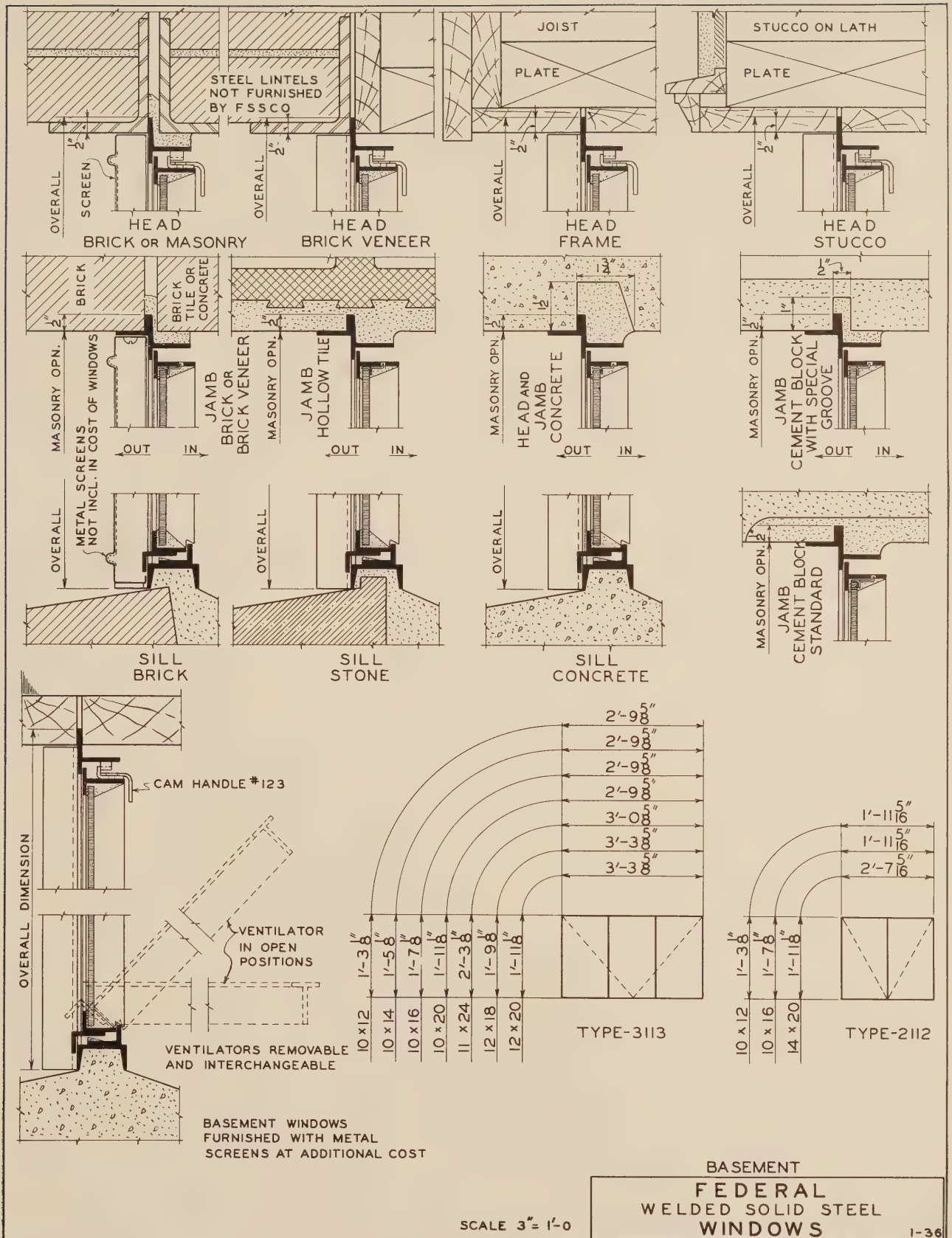
Screens are attached to the Window by brass screws in the jamb guide angles.

Screen Frames are given **one dip coat of grey mineral oxide paint** at the Factory before shipment.

GLASS AND GLAZING

Glass and Glazing do not come under the Window Specification.





SPECIFICATIONS

FOR

HORIZONTALLY PIVOTED
TOP PIVOTED
BOTTOM HINGED

COMMERCIAL PROJECTED
ARCHITECTURAL PROJECTED
DETENTION

WINDOW SCREENS

MATERIALS

Frames are **solid steel** sections, drawn to profiles shown on Plate, Page 24. **Bronze or aluminum** sections can be furnished, if specified.

Screen cloth is **No. 16 mesh copper wire cloth**. **Aluminum cloth** can be furnished, if specified, as can **other mesh**.

Splines are copper wire.

Baffles, Boxes, attaching Clips and parts are **No. 16 gauge steel**.

CONSTRUCTION

Frames are **welded** at each corner. They are **rewireable**. Clips and attaching parts are held in place by **brass screws**, tapped into the Window members.

Horizontally Pivoted and Top Pivoted Ventilator Screens (see Plate, Page 24), are made in two sections, the upper **fixed** in position on the **outside**, and the lower **fixed** in position on the **inside** face of the Window and held in position by clips. A **baffle** is attached to the outside face below the Screen, so that as the Ventilator opens the baffle is always in contact with the lower edge of the Screen. The lower Screen has a baffle at its upper edge which is always in contact with the glass in the Ventilator. These two baffles completely close the Ventilator opening.

On each side of the Ventilator opening, between the Ventilator jamb and the adjacent frame opening, is a **sliding brass shoe**, attached to the Ventilator, which moves with the motion of the Ventilator, closing the opening at the jamb caused by the separating of the Ventilator weathering members. Horizontally Pivoted and Top Pivoted Ventilators have **Spring Catch Hardware** at the Ventilator head.

Bottom Hinged and Commercial In Projected Ventilator

Screens are attached to the exterior face of the Window by **spring clips** and **corner boxes**.

Commercial Out Projected Ventilators have two types of **Screen**, both attached to the **inside** face of the Window. One type sets back slightly from the face of the Window. The Screen is **hinged** at the top and is closed at the bottom by a **button latch and keeper**. **Cam Latch Hardware** only is used at the sill of the Ventilator. To open the Ventilator, the button latch is tripped and the Screen swung open, in which position the **Cam Latch** is exposed.

The other type has a **fixed Screen** attached to the **inside face** of the Window. Standard hardware on the Ventilator is replaced by **Underscreen Hardware**, (See Plate, Page 24), consisting of a **push bar**, with a swivel connection to one leaf of a hinge and provided with a **spring keeper** to hold the push bar in position when the Ventilator is closed. The bar slides through a slot in the member at the bottom of the frame opening. The other leaf of the hinge is attached to the sill of the Ventilator.

HOT GALVANIZING

Frames can be **hot dip galvanized**, if specified, **after fabrication**.

PAINT

Frames, baffles and other parts, not brass, are given **one coat of black enamel baked on** at the Factory before shipment.

INSTALLATION

Screens ordered with Windows, have Windows prepared for Screens at Factory, and are installed by the Window erector. **Installation directions** are furnished with each shipment of Screens.

SPECIFICATIONS

FOR

UTILITY AND BASEMENT WINDOW SCREENS

Frames are **No. 16 gauge sheet metal**, formed to profile shown on Plate, Page 22.

Screen Cloth is **No. 16 mesh copper wire cloth**. 18 mesh can be furnished if specified.

Splines are coppered wire.

CONSTRUCTION

Frames are **welded** at corners. They are **rewireable**. Screens

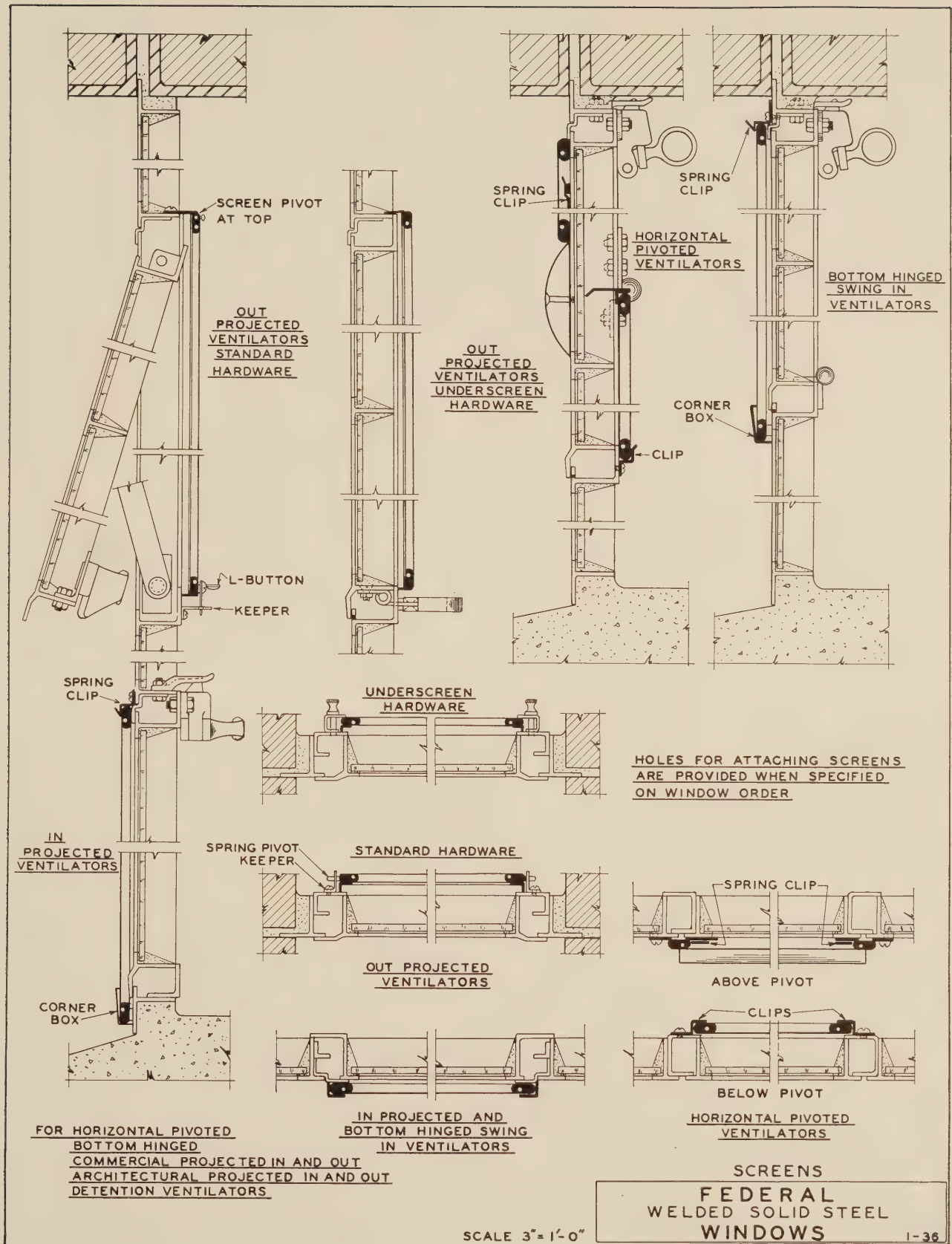
are attached to the **outside** face of the Window with **brass screws**.

PAINT

Frames are given **one dip coat of grey mineral paint** at the Factory before shipment.

INSTALLATION

Installation does not come under the Screen Specification.



SPECIFICATIONS

FOR

CONTINUOUS WINDOWS

MATERIALS

All material is **mild open hearth steel**, hot rolled or formed to profiles shown on Page 26. **Muntins** are $1\frac{1}{4}" \times 1\frac{1}{4}" \times \frac{3}{16}"$ Tees. **Jamb**s are $1\frac{1}{2}" \times 1\frac{1}{2}" \times \frac{1}{8}"$ Angles. **Head** members are $2" \times 1\frac{1}{2}" \times \frac{3}{16}"$ Angles.

CONSTRUCTION

Head and sill members run continuous from end to end of Panel Sections. Jamb members and vertical muntins run from head to sill and are coped to fit members to which they join. Muntins are spaced 2' 0" on centers. **All joints and connections are full welded, continuous along contact lines both in face and depth.** Panel Sections are joined together by bolts. **Expansion Joints** are provided for runs where required.

Storm and End Panels, fixed lights, End Panels in the plane of the Window and Storm Panels set back from the swing portion of the Window, are provided at the end of each swing or operating run. The set back portion of the Storm Panel is fitted with a No. 14 **steel Drip Plate** to carry rain and condensation to the outside of the Window. Storm and End Panels act as expansion joints. A **formed steel Plate** is provided between the end of the swing section and the Storm Panel to prevent rain from entering when Window is closed.

HARDWARE

Fixed Windows are attached at the head to the structure of the building by **formed steel Clips**, spaced 4' 0" on centers, **welded** to the Window head and bolted to the building structure. **Steel Straps**, 4' 0" on center, are bolted to the sill of the Window

and suitably attached to the building structure at the bottom of the Window opening.

Swing Windows, have **heavy pressed steel Hinges with bronze pins**, spaced 4' 0" on center, bolted to the head of the Window and to the building structure. (See Cut, Page 8).

The Window **Operator** is bolted to the sill.

Glazing Clips, $\frac{5}{8}" \times \frac{5}{8}" \times \frac{1}{8}"$ angles, $1\frac{1}{8}"$ long, attached to the muntins and jambs by **brass bolts and screws**, are furnished for each light.

HOT GALVANIZING OR RUST PROOFING

Windows are **hot dipped galvanized** or otherwise **rust proofed, after fabrication** and before installing, if specified.

PAINT

Windows are given **one dip coat of grey mineral oxide paint** at Factory before shipment.

MECHANICAL OPERATORS

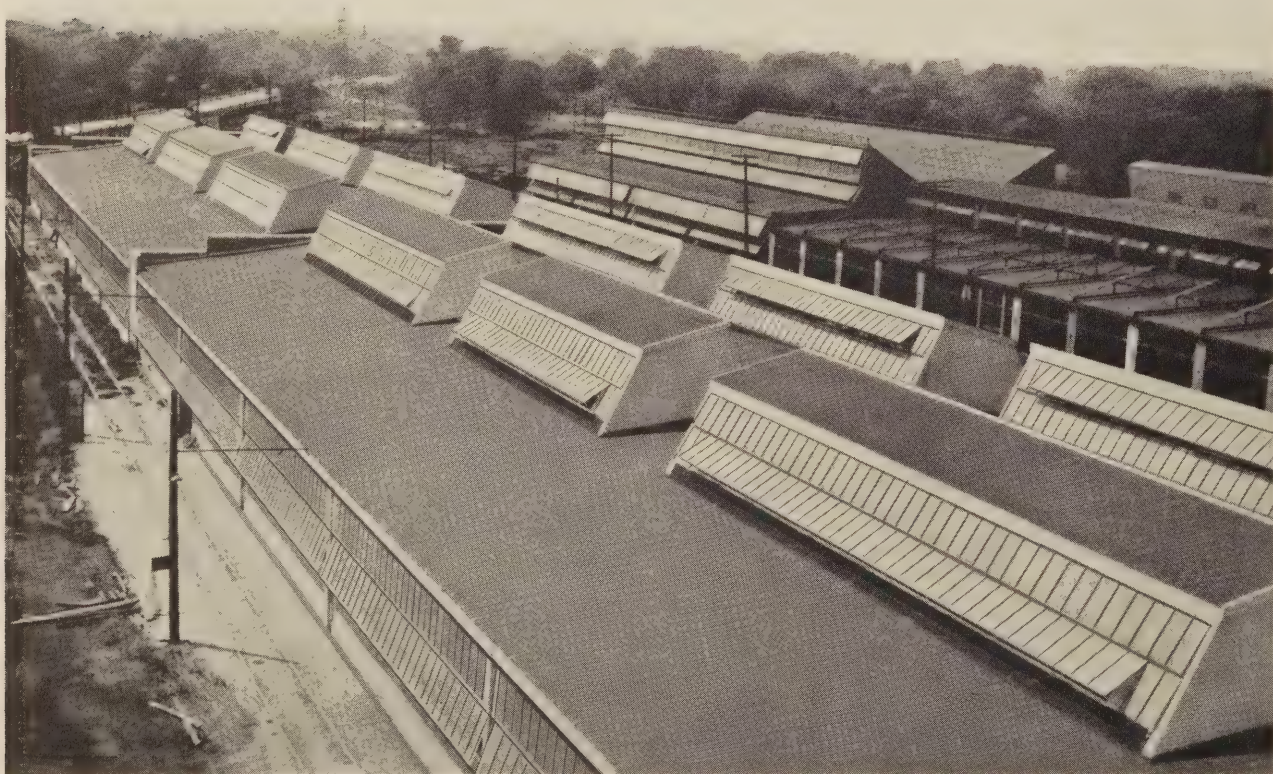
See Mechanical Operator Specification, Page 27.

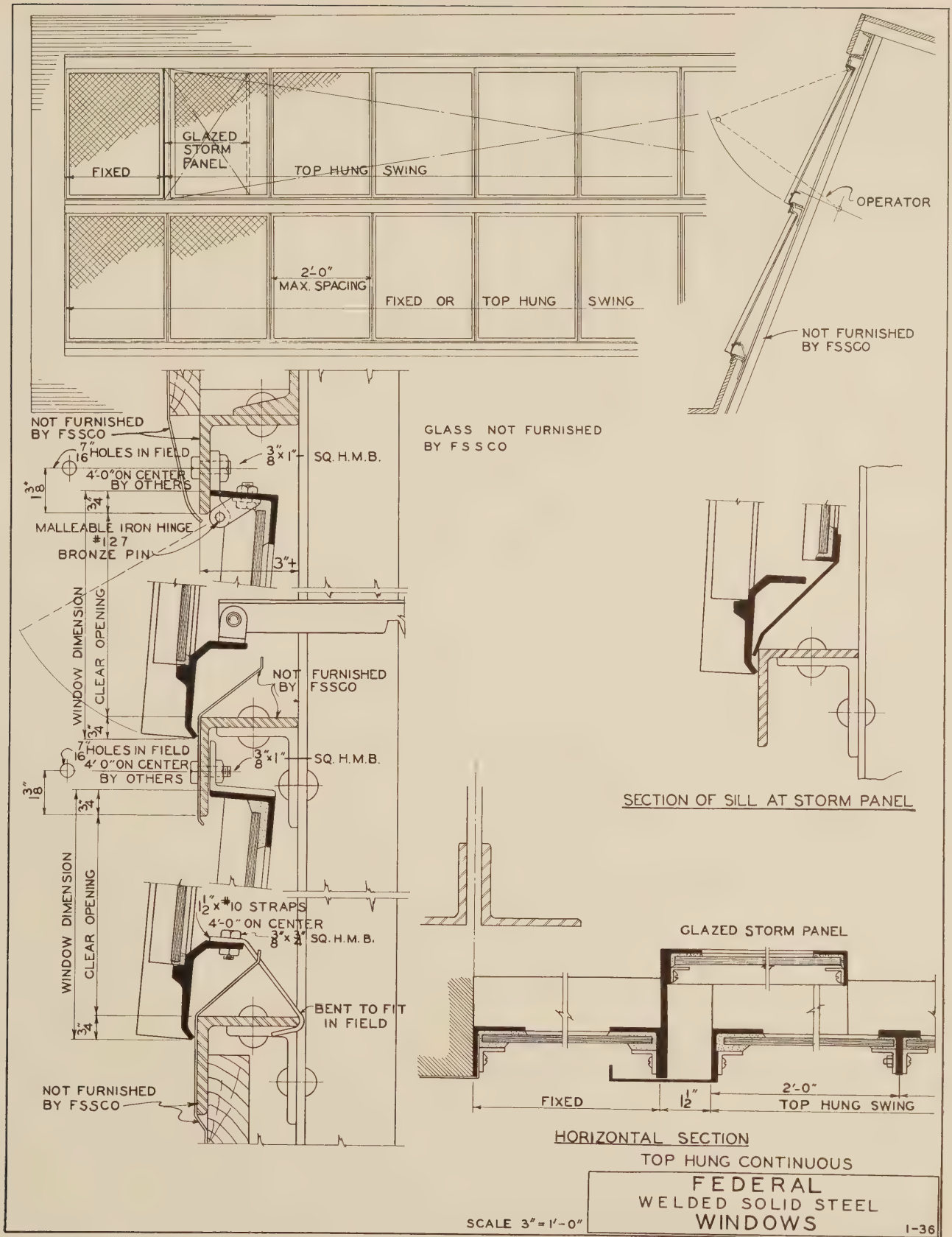
INSTALLATION

See Installation Specification, Page 34.

GLASS AND GLAZING

Glass and Glazing do not come under the Window Specification.





SPECIFICATIONS

FOR

WINDOW OPERATORS

OPERATING DEVICES are of three general types—the **Lever Arm**, used for Horizontally Pivoted and Commercial Projected Ventilators, the **Rack and Pinion**, used for Horizontally Pivoted and Commercial Projected Ventilators and the **Tension**, used for Horizontally Pivoted Ventilators and for the swing sections of Top Hung Continuous Windows.

LEVER ARM OPERATOR

for

Horizontally Pivoted, Top Pivoted and Bottom Hinged Ventilators

MATERIALS AND CONSTRUCTION. (See Plate, Page 29). **Horizontal shaft** is 1" (1 $\frac{3}{16}$ " O. D.) standard pipe. **Couplings** are **cast iron clamp collars with set screws**. **Shaft brackets** have formed steel bars and **cast iron shaft bearings**, and are **adjustable**. **Lever arms and connecting rods** are **steel**. **Lever arms** are fastened to the shaft by a **bolted steel clamp collar**, providing **adjustment** in setting. **Connecting rods** are **swivel bolted to cast iron clips** bolted to the vertical muntins and to the lever arms.

POWERS, open, are assembled in **open cast iron housings**, bolted to **formed steel brackets**, fastened to the building. **Powers** consist of a **cast iron irreversible segment gear**, fastened to the horizontal shaft by a **set screw, field drilled**, and a **cast iron worm** splined to a **steel shaft**.

An **enclosed power** can be furnished, if specified, in place of the open power. The housing is an **oiltight cast iron case** and the **segment gear and worm** are **machine cut steel and run in oil**.

OPERATION. Hand Chain operation is through a **cast iron chain wheel**, mounted on the worm shaft with **chain guides** and **endless jack chain** to within 4' 0" from the floor. Where change of direction of the chain is necessary, or support is required on long spans, **double idlers, two cast iron guide wheels** mounted on **steel strap supports** which attach to the building, are furnished, with a **single wheel idler to anchor the end of the chain**.

Vertical Shaft operation is through a $\frac{7}{8}$ " **steel shaft** with **cast iron sleeve** and **set screw couplings**, connecting it to the worm shaft of the power. **Adjustable steel steady brackets** are provided for the vertical shaft. Where change of direction is required **universal joints** or **mitre gear sets with cast iron housings** are used.

At the lower end of the vertical shaft is a **cast iron hand wheel**. If the wheel is in **horizontal** position it is attached by a set screw directly to the shaft. If in a **vertical** position, an **open mitre gear set** is furnished, with a **cast iron gear and thrust bearing** on the vertical shaft, and a **cast iron gear on a steel stub shaft** which carries the hand wheel. An **oiltight cast iron housing** can be furnished, with **machine cut steel gears running in oil**, if specified.

MUTIPLE RUNS of Ventilators, one above the other, can be **operated from one control point**, provided the total length of horizontal shaft and/or number of Ventilators does not exceed the limits given below. Where multiple runs are operated, a power is located on the lowest run of shaft and the upper runs each have a power, operated from the lowest power by vertical shaft, as for vertical shaft Operator described above.

LIMITS. The following **limits** should not be exceeded for satisfactory operation:

Horizontally Pivoted and Commercial Projected

Ventilators.....40' 0" of shaft and/or 6 Ventilators on each side of power.

Top Pivoted and Bottom Hinged

Ventilators.....30' 0" of shaft and/or 4 Ventilators on each side of power.

SCREW TYPE OPERATOR

for

Horizontally Pivoted and Top Pivoted Ventilators.

This Operator, (see Plate, Page 30), is used for **single bays where a number of Ventilators are to be operated from one control station**. It is a **Lever Arm Operator with special type vertical shaft operation**.

MATERIALS AND CONSTRUCTION. **Horizontal shaft, lever and connecting arms** are as described for **Lever Arm Operator**, above. **Vertical shaft** is $\frac{7}{8}$ " **steel shaft**, with **cast iron couplings** to connect lengths, and with **cast iron cross-heads** running on **steel guides** bolted to the Window mullions. At each horizontal shaft a **cast iron bracket is clamp bolted** to the vertical shaft, to which is **swivel connected a steel connecting arm**, in turn swivel bolted to a **steel lever arm, clamped** to the horizontal shaft.

POWER. The lower end of the vertical shaft is **threaded** and carries an **internally threaded bronze mitre gear** with **thrust bearings** over and under. This gear meshes with a **cast iron mitre gear** attached to a **steel shaft**, on which is mounted a **cast iron hand wheel**. The mitre gears, shafts and hand wheel are assembled in an **open cast iron housing**, bolted to the building or to a mullion of the Window opening.

OPERATION. As the hand wheel turns, the mitre gears raise or lower the vertical rod, **actuating the connecting arms** and **revolving the horizontal shafts**, and, as in the **Lever Arm Operator**, open and close the Ventilators.

Motor Drive can be used with this Operator, if specified. (See Motor Drive Specification below.)

LIMITS. The following **limits** should not be exceeded for satisfactory operation. The **Operator cannot be used for more than one Window bay, or with Bottom Hinged Ventilators.**

Hand Power

Horizontally Pivoted Ventilators, 50° opening...50 Ventilators

Top Pivoted Ventilators, 30° opening.....20 Ventilators

Motor Drive

Horizontally

Pivoted Ventilators..160' 0" of horizontal shaft, in not to exceed 8 lines and/or 48 Ventilators.

Top

Pivoted Ventilators..100' 0" of horizontal shaft, in not to exceed 8 lines and/or 24 Ventilators.

TENSION OPERATOR

for

Horizontally Pivoted Ventilators.

MATERIALS AND CONSTRUCTION. **Horizontal shaft** is 1" (1 $\frac{3}{16}$ " O. D.) standard pipe. **Shaft brackets** are **steel bars**, with two **cast iron pipe rollers on brass sleeves**. Brackets are bolted to the building or to mullions, and are **adjustable**.

Each Ventilator is connected to the shaft by a **steel channel arm, hinged** to the Ventilator and attached to a **cast iron swiveling crosshead** on the shaft. The position of the crosshead is **adjustable** on the shaft, on which it is held in place by **two clamp collars**. (See Plate, Page 31).

POWER. A **cast iron worm and gear** operates a **cast iron pinion**, which in turn engages with a **steel channel rack**, bolted to the shaft, and provided with **limit stops**. The power is assembled in an **enclosed cast iron housing** and carried on **adjustable steel brackets**, bolted to the building.

OPERATION. Hand Chain operation is through a **cast iron chain wheel**, mounted on the worm shaft and equipped with **jack chain** to within 4' 0" from the floor. Where necessary to change direction of the chain to avoid interferences, **idlers**, as described above under **Lever Arm Operator**, are furnished.

Motor Drive can be used with this Operator, if specified. (See Motor Drive Specification below.)

LIMITS. The following **limits** should not be exceeded for satisfactory operation.

Hand Chain.....300' 0" of shaft.

Motor Drive.....600' 0" of shaft.

RACK AND PINION OPERATOR

for

Horizontally Pivoted, Top Pivoted, Bottom Hinged and Commercial Projected Ventilators.

MATERIALS AND CONSTRUCTION. Horizontal shaft is 1" (1 $\frac{1}{16}$ " O. D.) standard pipe. Couplings for pipe lengths are cast iron clamp collars with set screws. Brackets are formed steel bars with adjustable cast iron shaft bearings. Racks are machine cut steel bars or rolled steel angles, depending on length. They attach either to the top or bottom of Horizontally Pivoted and Commercial Projected Ventilators, to the bottom of Top Pivoted Ventilators and to the top of Bottom Hinged Ventilators by cast iron brackets bolted to the Ventilators. (See Plate, Page 32).

POWERS are mounted in cast iron housings, bolted to adjustable steel brackets, which in turn are bolted to the building. Powers consist of cast iron worm and gear. The gear is attached to the horizontal shaft, as is a cast iron pinion, the teeth of which engage the teeth of the steel racks. Each rack is provided with a pressed steel keeper to hold it in engagement with the pinion and with a pressed steel stop, bolted to the end of the rack. Racks can be either straight or curved, the curved rack being used where the projection of the straight rack would be undesirable.

An enclosed power can be furnished, if specified, in place of the open housing. The enclosed power has an enclosed cast iron housing with a machine cut steel gear segment and pinion, all running in oil.

OPERATION. Hand Chain operation is through a cast iron chain wheel mounted on the worm shaft with chain guides and jack chain to 4' 0" from the floor. Where necessary to change direction of the chain to avoid interferences, idlers, as described above under Lever Arm Operators, are provided.

Vertical Shaft operation is through a $\frac{3}{4}$ " steel shaft, with cast iron clamp couplings. The upper end of the shaft carries the worm and the lower end a horizontal cast iron hand wheel, or, an open cast iron housing containing a cast iron mitre gear set, one gear on the vertical shaft and the other on a steel stub shaft. The end of the stub shaft carries a vertical cast iron hand wheel. In place of the open housing, if specified, an enclosed cast iron housing with machine cut steel gears, running in oil, can be furnished.

Motor Drive can be used on this Operator, if specified. (See Motor Drive Specification below).

Two or more runs of Ventilators can be operated from one control station. Where so arranged, a power is used on each line of horizontal shaft, connected with the line below by a vertical shaft.

LIMITS. The following limits should not be exceeded for satisfactory operation.

Hand Power

Horizontally

Pivoted Ventilators... 80' 0" of shaft and/or 12 Ventilators on each side of power

Top Pivoted and Bottom Hinged

Ventilators..... 40' 0" of shaft and/or 8 Ventilators on each side of power.

Commercial

Projected Ventilators... 50' 0" of shaft and/or 10 Ventilators on each side of power.

Motor Drive, Single Line of shaft:

Horizontally

Pivoted Ventilators... 150' 0" of shaft each side of power.

Top Pivoted and Bottom Hinged

Ventilators..... 75' 0" of shaft each side of power.

Commercial

Projected Ventilators... 85' 0" of shaft each side of power.

Multiple Lines of shaft:

Horizontally

Pivoted Ventilators... 600' 0" of shaft, but not to exceed 3 lines.

Top Pivoted and Bottom Hinged

Ventilators..... 230' 0" of shaft, but not to exceed 2 lines.

Commercial

Projected Ventilators... 300' 0" of shaft, but not to exceed 2 lines.

TENSION OPERATOR

for

Swing Sections of Top Hung Continuous Windows.

MATERIALS AND CONSTRUCTION. Horizontal shaft is 1" (1 $\frac{1}{16}$ " O. D.) standard pipe, supported on steel brackets, bolted to the building, and carrying pipe rollers with brass sleeves, with adjustable connections. Pipe couplings are inside steel stubs, riveted. Lifting arms are rolled steel sections, toggle action, one arm being connected to the sill of the swing section and to the horizontal shaft, and the other arm connecting with the first arm and bolted to the bracket. Swivel joints of arms are fitted with brass washers. The end of the arm attaching to the horizontal shaft is fastened to a shaft collar, which is pinned through the shaft, after being adjusted to position. (See Plate, Page 33).

POWER is supported on adjustable steel brackets, bolted to the building, and by a vertical diagonal support rod running from the Power to the building. Power consists of a cast iron oiltight housing in which are assembled a machine cut steel pinion and gear, which engage with a cast iron machine cut tooth rack. This rack forms a part of the horizontal pipe shaft, to which it is coupled at each end. Stops adjusting limit of travel are provided. They consist of adjustable screws carried by the couplings at each end of the rack, and a sliding steel bar carried in lugs on the power housing, to which is attached a throw-out clutch. The travel of the rack brings the screw stop into contact with the bar, which when moved, throws the stub shaft carrying the chain wheel and pinion out of gear.

OPERATION by Hand Chain is through a cast iron chain wheel and jack chain to within 4' 0" of the floor.

Motor Drive. When Operator is motor driven the motor is attached to the bottom of the housing, the chain wheel and chain guards are removed, and replaced by a toothed gear to take a silent chain drive from the motor pinion. The travel limit stop is coupled with the electrical equipment limit switch and operates by stopping the motor.

LIMITS. The following limits should not be exceeded for satisfactory operation, depending on height of Window.

Hand Power

Windows vertical..... 275' 0" to 200' 0"

Windows not over 30° from vertical..... 200' 0" to 120' 0"

Motor Drive

Windows vertical..... 400' 0" to 325' 0"

Windows not over 30° from vertical..... 240' 0" to 150' 0"

MOTOR DRIVE

Motor Drive can be furnished for the Screw Type Operator, Tension Operator for Horizontally Pivoted Ventilators, Rack and Pinion Operator for Horizontally Pivoted, Top Pivoted, Bottom Hinged and Commercial Projected Ventilators, and Tension Operator for Top Hung Continuous Windows. Standard drive is for 220 or 440 volt, 3 phase, 60 cycle A. C. Drive consists of an enclosed ball or metaline bearing motor, attached to the under side of the Power, drive pinion, sprocket and silent chain, magnetic reverse switch and limit switches and individual push button control. A wiring diagram is also furnished. Main line switches and fuses, fuse and switch boxes, conduits and wiring are not part of the Motor Drive Specification.

HOT GALVANIZING

Operators can be hot dip galvanized, if specified, except powers. Powers are given a coat of aluminum paint at the Factory before shipment.

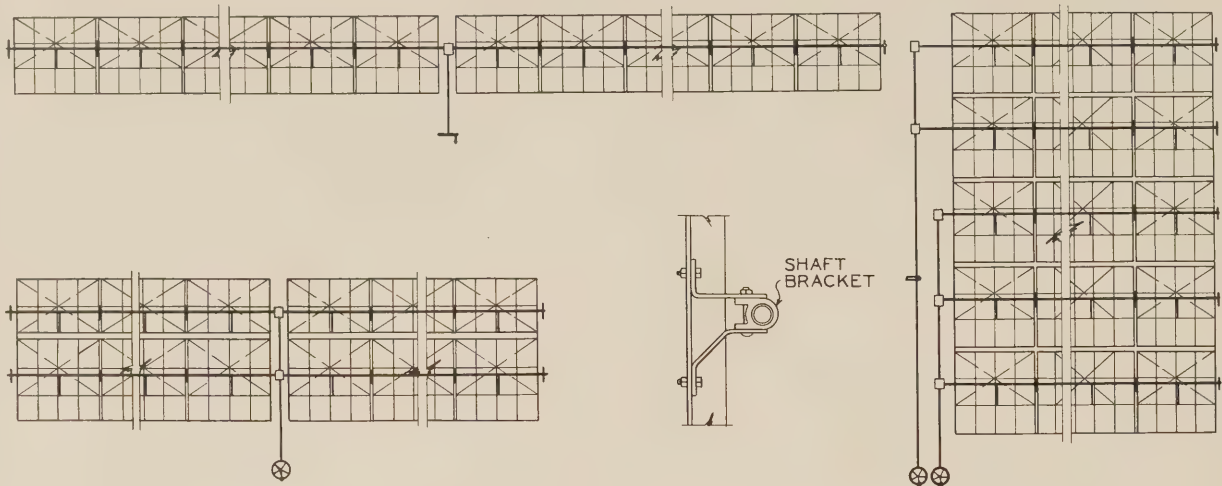
PAINT

Operators are given one coat of black mineral oxide paint at the Factory before shipment.

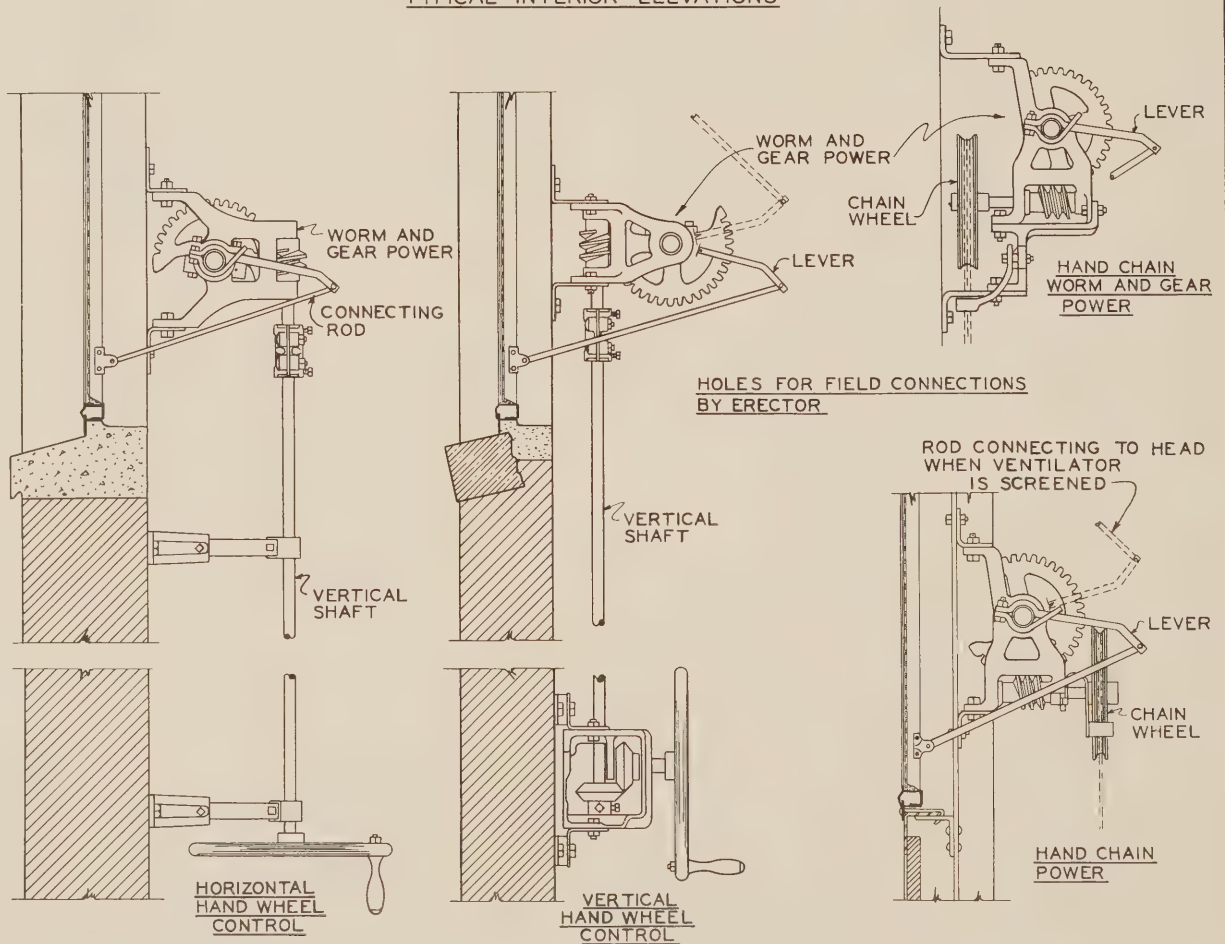
INSTALLATION

See Installation Specification, Page 34.

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TYPICAL INTERIOR ELEVATIONS



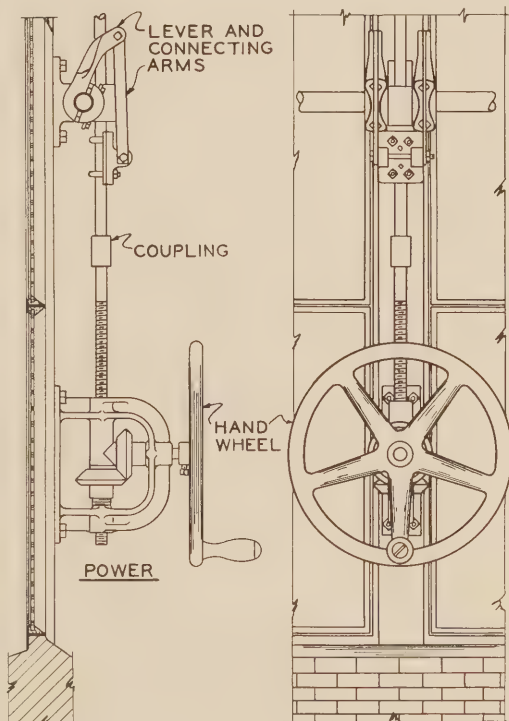
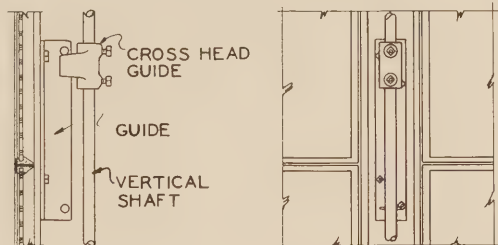
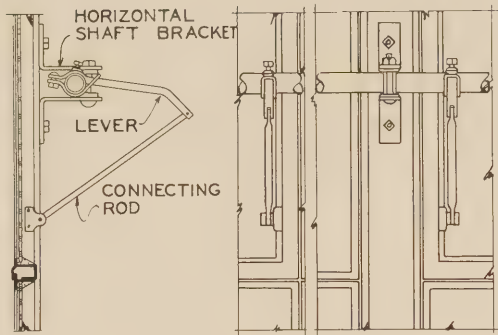
FOR HORIZONTAL PIVOTED
AND COMMERCIAL PROJECTED VENTILATORS

LEVER ARM OPERATOR

FEDERAL
WELDED SOLID STEEL
WINDOWS

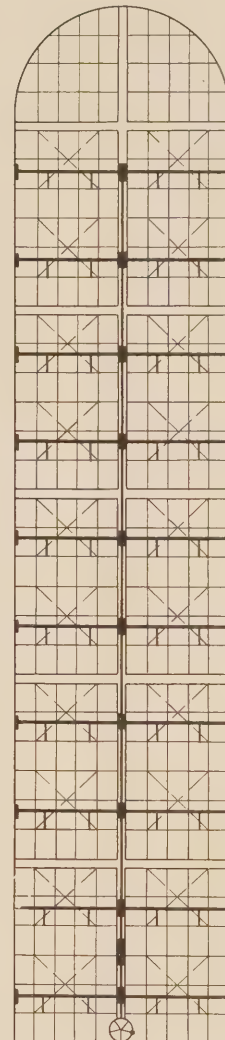
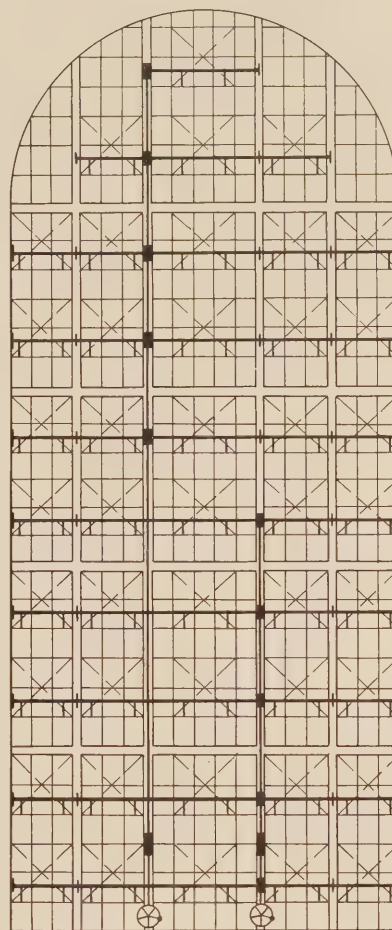
SCALE 1" = 1'-0"

I-36

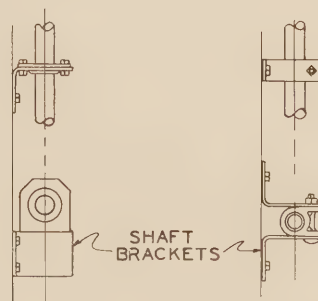


HOLES FOR FIELD CONNECTIONS
BY ERECTOR

FOR HORIZONTAL PIVOTED
AND COMMERCIAL PROJECTED VENTILATORS



TYPICAL INTERIOR ELEVATIONS



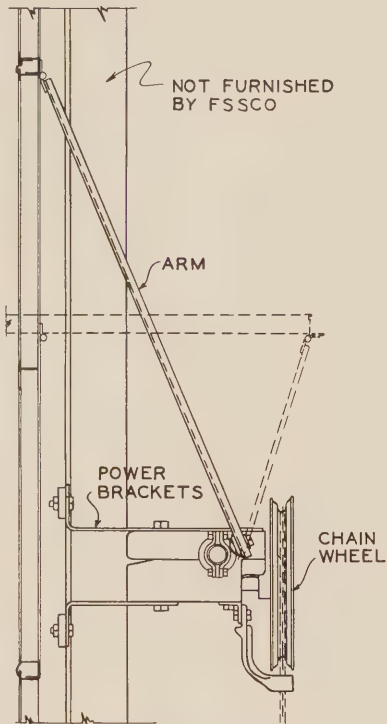
SCREW TYPE OPERATOR
FEDERAL
WELDED SOLID STEEL
WINDOWS

SCALE 1"=1'-0"

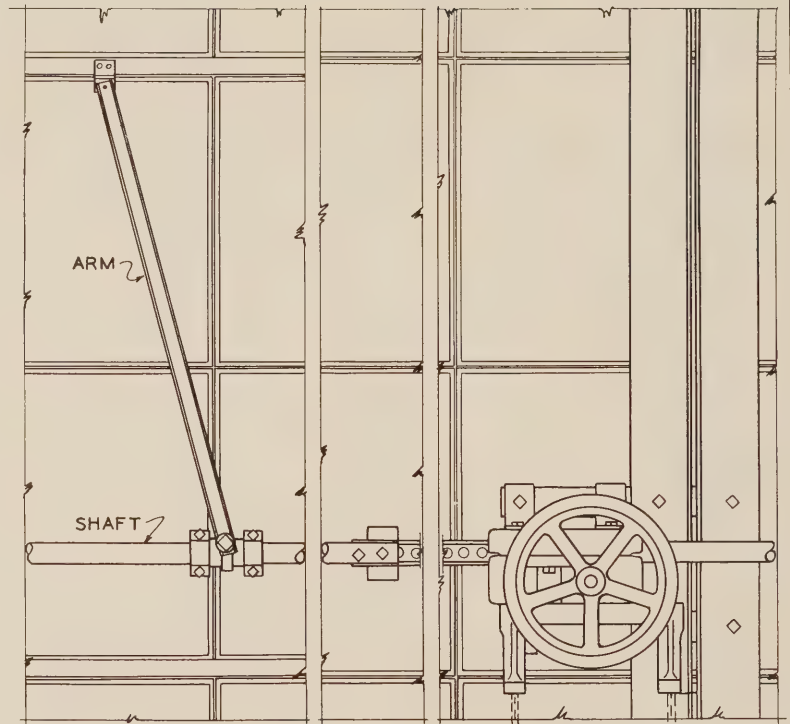
I-36



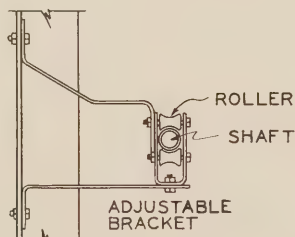
INTERIOR ELEVATION AND PLAN



ELEVATION OF HAND CHAIN POWER



INTERIOR ELEVATION AT POWER



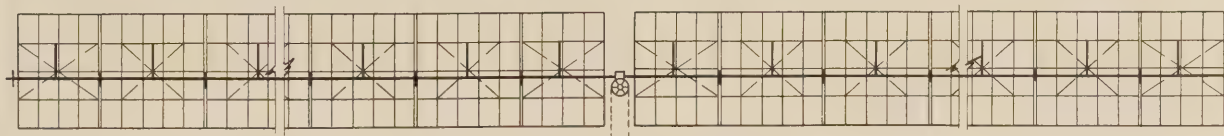
HOLES FOR FIELD CONNECTIONS BY ERECTOR

FOR HORIZONTAL PIVOTED VENTILATORS

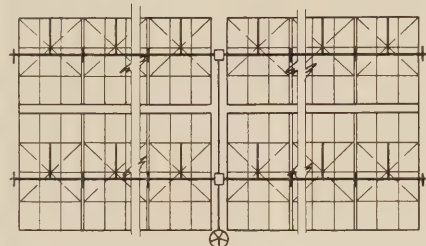
TENSION OPERATOR
FEDERAL
WELDED SOLID STEEL
WINDOWS

SCALE 1"=1'-0"

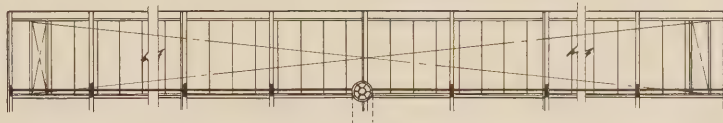
I-36



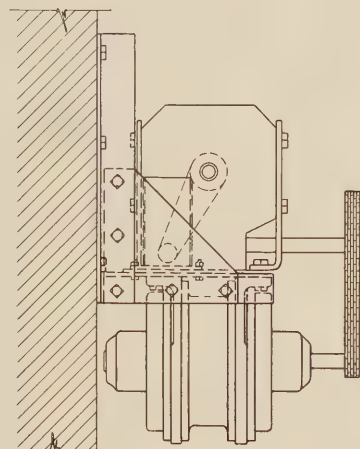
TYPICAL INTERIOR ELEVATION WITH HORIZONTALLY PIVOTED WINDOWS



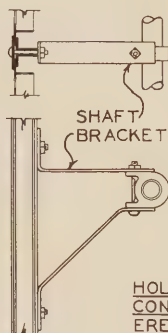
MULTIPLE RUNS



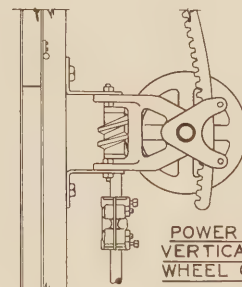
TYPICAL INTERIOR ELEVATION AND PLAN WITH TOP HUNG CONTINUOUS WINDOWS



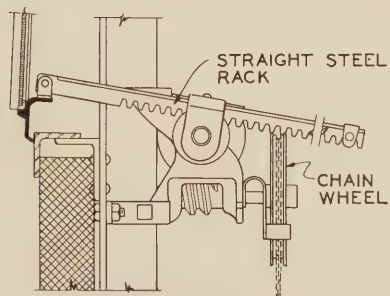
POWER WITH MOTOR DRIVE
EQUIPPED WITH MAGNETIC
REVERSE OVERLOAD RELAY
AND 3 BUTTON CONTROL



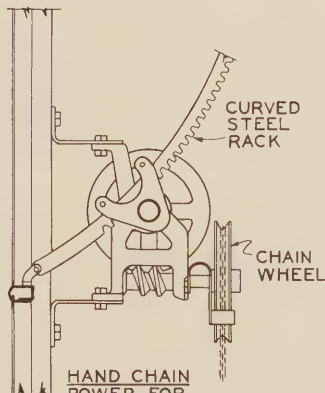
HOLES FOR FIELD
CONNECTIONS BY
ERECTOR



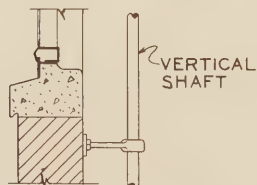
POWER FOR
VERTICAL HAND
WHEEL CONTROL



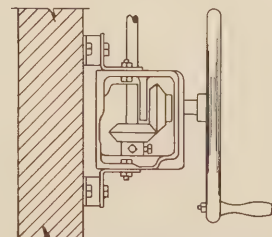
HAND CHAIN POWER
FOR STRAIGHT RACK



HAND CHAIN
POWER FOR
CURVED RACK



VERTICAL
SHAFT



HAND WHEEL CONTROL
FURNISHED WITH EITHER
VERTICAL OR HORIZONTAL
HAND WHEEL

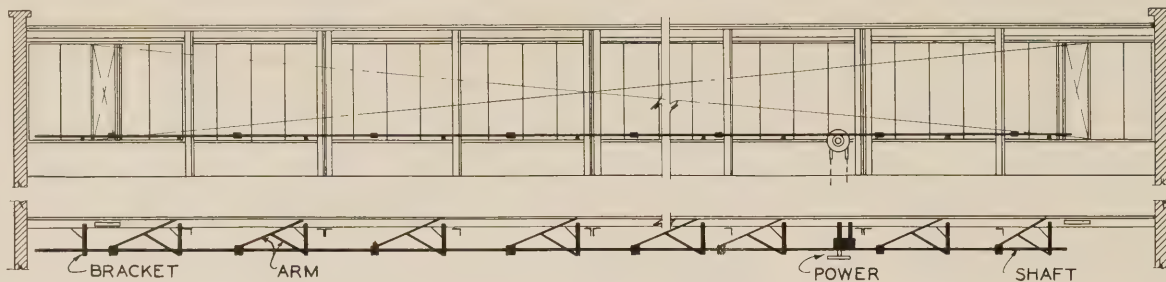
FOR HORIZONTAL PIVOTED-COMMERCIAL PROJECTED
AND CONTINUOUS WINDOWS

RACK AND PINION OPERATOR

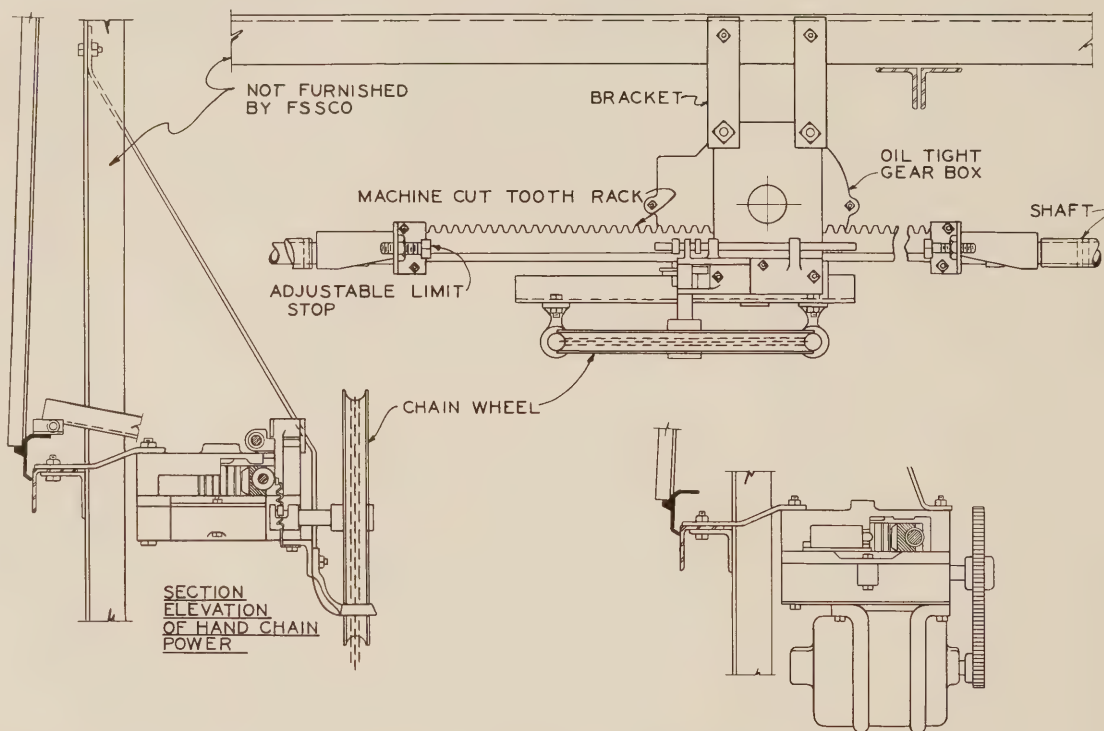
**FEDERAL
WELDED SOLID STEEL
WINDOWS**

SCALE 1"=1'-0"

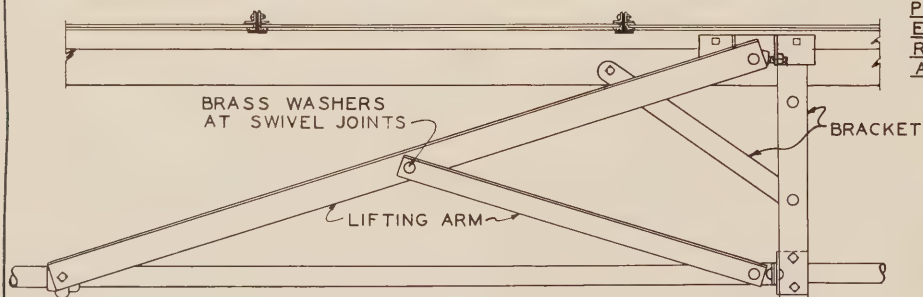
1-36



INTERIOR ELEVATION AND PLAN

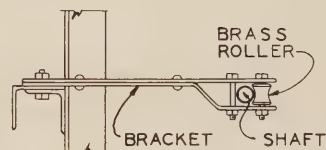


POWER WITH MOTOR DRIVE
EQUIPPED WITH MAGNETIC
REVERSE, OVERLOAD RELAY
AND 3 BUTTON CONTROL



PLAN OF LIFTING ARM

HOLES FOR FIELD CONNECTIONS
BY ERECTOR



FOR CONTINUOUS WINDOWS

TENSION OPERATOR
FEDERAL
WELDED SOLID STEEL
WINDOWS

SCALE 1" = 1'-0"

1-36

SPECIFICATIONS

FOR INSTALLATION

WINDOWS

PIVOTED, COMMERCIAL PROJECTED, ARCHITECTURAL PROJECTED, DETENTION and UTILITY WINDOWS. Each unit shall be inspected before installing to make sure it has not been damaged in transit. Bent or distorted members shall be straightened.

Units must be set level and plumb and horizontal muntins in combined units must be in line. **Clearances** shall be allowed as called for by manufacturers' Catalog or installation drawings.

Ventilators shall be tested individually to insure proper operation. Wires holding Ventilators shall not be cut until units have been set permanently in place.

Hardware attached at the Factory shall be adjusted, and Hardware shipped separate shall be securely attached and adjusted, after units are set permanently in place. Ventilator operating Hardware must permit easy operation and positive weathering of the Ventilator when closed.

Clips for fastening Windows to steel framed structures and wall and sill anchors when in place shall have bolts drawn up tight. **Mullions and sill anchors** must be firmly imbedded in mason work.

Mason Work. (See Plate, Page 16.) **Windows openings in masonry, brick, tile or concrete block walls shall be prepared by others** before units are installed. Openings not properly prepared or true to dimension and shape must be made so before installation of units. **Crow bars, hammers or prys must not be used in installing Windows.**

Poured concrete wall openings must have reveals provided in the concrete forms.

Windows combined by Mullions shall be loosely connected up, **plumbed, leveled and muntins lined up**, blocked securely in position and the Mullions set and **bolts tightened.**

Sills. Windows must rest flush on the sill and **no openings left in which water can collect.**

Steel frame structures shall have **holes punched** in the structural members by **the fabricating shop** to take clips which attach the Windows.

CONTINUOUS WINDOW panels shall be inspected before installation to be sure they are straight and free from wind. **Clips must be bolted firmly in place, weathering overlaps must be in continuous contact.** Holes for attaching Windows to steel construction shall be located and punched or drilled in the field by the Window erector. (See Plate, Page 26).

DOORS

SWING, SLIDE, ACCORDION, BIFOLD, CANOPY AND TWO SECTION VERTICAL LIFT DOORS and Frames, Guides and Counterweight Boxes shall be inspected before installing to be sure that they have not been damaged or sprung in transit and are free from wind or twist.

Frames shall be installed square and plumb and proper width maintained from head to sill of frame. Doors must be set plumb and level. Clearances must be maintained between Doors and Frames. (See Plate, Pages 38 to 42). **Hangars and tracks** shall be straight and true and free from twist or wind. **Door leafs shall be adjusted for proper clearances,** both between Door and wall and Door and sill.

Operators must work smoothly and without binding. Counterweights must be properly adjusted and work in boxes without interference.

Locks and hardware shall be attached in accordance with manufacturers' instructions and shall work smoothly and without interference.

HANGAR DOOR LEAFS shall be inspected before installation to make sure they have not been damaged in transit.

Trucks and hardware shall be assembled and attached in the field in accordance with manufacturers' instructions. **Bolts attaching trucks and top rollers must be drawn tight in place. Each Leaf must be adjusted on its trucks to insure easy rolling and freedom from binding.**

FIELD PAINTING

WINDOWS, OPERATORS AND DOORS shall receive **one brush coat of (specify make) paint after installation and before glazing.**

SCREENS

SCREENS shall be attached to Windows, where specified, in accordance with manufacturers' instructions. **Screens shall fit accurately, no openings shall exist between Screen and Window.**

OPERATORS

LEVER ARM, SCREW TYPE AND RACK AND PINION OPERATORS, shall have shaft brackets and supports adjusted to allow free turning of the shaft without binding. Shaft must be level and straight. Arms, connecting rods and racks shall be adjusted for each Ventilator to compensate for torsion in the shaft, and weathers each Ventilator tight when in closed position. After adjusting the Operator, all bolts, screws, etc. shall be set up tight and the Operator shall work smoothly and without binding.

TENSION OPERATOR FOR PIVOTED WINDOW VENTILATORS shall have arms adjusted so that each Ventilator weathers tight when closed. Shaft must move smoothly through brackets and be free from binding. After adjusting, all bolts, screws, etc. shall be set up tight. Limit Stops shall be set to hold operation within proper limits. The Operator shall be finally tested for proper performance.

TENSION OPERATOR FOR CONTINUOUS WINDOWS shall have arms adjusted so that each arm carries its proper portion of the load and the Window is not sprung or racked in opening and closing. Shaft must travel freely in brackets without binding. After adjusting, all bolts, screws, etc. shall be set up tight. Limit Stops shall be set to hold operation within proper limits. The Operator shall be finally tested for proper performance.

MOTOR DRIVE OPERATORS with Motor Drive shall be adjusted and set as provided above before attaching motor drive. Motors shall be firmly attached to Operator and drive chain adjusted for proper operation. Operators shall be moved by hand to full open and closed position and limit stops set to stop operation at these limits. After current has been delivered, the setting of limit switches and push button control shall be checked and adjusted under power.

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SPECIFICATIONS

FOR

DOORS

(EXCEPT HANGAR DOORS)

MATERIALS

TUBULAR DOORS depending upon the size of Leaf, have **Rails and Stiles of cold drawn mild steel lip or seamless tube**, of dimensions shown on Plates, Pages 37 to 43. **Tubes are of various thickness from No. 16 to No. 11 gauge steel.**

STRUCTURAL Bifold, Canopy and Two Section Vertical Lift DOORS are made from **mild steel shapes**, hot rolled to profiles shown on Plates.

Astragals for weathering double Doors are **steel**.

Window Panels of Doors are **Glazing Angle Windows**, described under Window Specification, (see Page 4), glass sizes being special to meet panel dimensions.

Plate Panels are **No. 14 gauge** patent leveled **steel sheets**.

All **Plate** or all **Window panels** can be furnished, if specified.

Frames for Light Swing Doors are **No. 16 and No. 14 gauge pressed steel**, made to profiles shown on Plate, Page 38. Heavy Swing Doors are **hot rolled structural steel channels**, with **steel angle or bar stops**, shown on Plate, Page 39.

CONSTRUCTION

Rails and Stiles are continuous from head to sill and from jamb to jamb, and are **full welded on all four sides** at intersections and joints.

Window and Plate Panels, are tack welded to the **Rails and Stiles**.

Pilot Doors can be furnished, if specified, for Swing, Slide, Accordion, Bifold, Canopy and Two Section Vertical Lift Doors. **The construction is the same as a Lip Tube Swing Door. Pilot Doors cannot exceed 3'0" x 7'0" in size.** The panel in which the Pilot Door is carried, has a **frame** of the same type, **tube or structural**, as the main Leaf. Pilot Doors have **steel hinges** bolted to the Leaf and to the frame, and are fitted with a Lock.

Frames are furnished for Swing Doors only. Frames for openings with all other types of Doors are not part of the Door Specification.

Pressed metal Frames, are furnished, if specified, to profile shown on Plate, Page 38. Frame consists of jambs and header only, **no threshold or sill being furnished.** Frames are **shipped knocked down.** Clip angles, field bolted, are **welded** to jambs and bolted to header.

Structural Frames, rolled steel channels, are furnished for Light Swing Doors, if specified in place of pressed metal Frames, and for Heavy Swing Doors. Rolled **steel angle weathering** is **welded** to the channel for lip tube Doors and rolled **steel bar weathering** for seamless tube Doors. Frames are **shipped knocked down.** Clip angles, field bolted, are **welded** to jambs and bolted to header.

HARDWARE

The variety of Locks and Hinges which can be furnished precludes the possibility of description. (See Cuts, Page 40).

SWING DOOR HARDWARE is **steel half surface Butt Hinges, steel Top and Bottom Bolts** for inactive Leaf of double Doors, and, if specified, the following:

Hinges, ball bearing and double acting, **brass plated or bronze.**

Push Plate with or without **Pull Handle.**

Cylinder Lock with or without **master keyed cylinder, Bit Key Lock.**

Lever Latch, Mortise Latch, Thumb Latch.

Door Closer, Hook Back and Ring, Antipanic Bolts.

SLIDE DOOR Hardware is **Track and Trolleys, Hasp and Staple, Flush Handle, Floor Guide and Door Stop**, and, if specified, a **Cylinder Lock**, with or without **master keyed cylinder.**

Tracks and Trolleys for Slide Doors, consist of a **drawn steel track**, supported by **steel hangars** which attach to the building. **Four-wheel forged steel ball bearing trolleys** run inside the track. The forged steel trolley frame carries a **steel swivel pintle**, threaded at lower end. The pintle attaches to the Door header by a **pressed steel bracket, bolted** through the tube. The position of the Door Leaf is adjustable by **lock nuts** on the threaded pintle.

ACCORDION DOOR Hardware is **Track and Trolleys, steel Strap Hinges, Chain Bolts, Cane Bolts**, and, if specified, **Cylinder Lock** with or without **master keyed cylinder.**

BIFOLD DOOR Hardware is **steel supporting Hinges on each corner, structural Guides, Counterweights and Boxes, center Hinges and Operators, including cable.** (For light tube Doors less than 100 square feet in area, Operator is not furnished unless specified.)

Operator consists of a **cast iron housing** carrying a **double cast iron steel cable sheave**, mounted on a **steel shaft.** At each corner of the Door sill is **welded a steel bracket** carrying a **steel spindle**, on one end of which runs a **cast iron roller.** The spindle carries a **steel bar engaging with the steel guides**, attached to the jambs of the Door opening. **Formed steel boxes** are attached to the jambs of the opening, in which the **counterweights** run. **Steel cables** attach to the counterweights and to the Door, running over the sheaves.

For Doors 100 square feet or over in area, a **hand chain Operator** is used. This is a **cast iron chain wheel, jack chain** to within 4'0" from floor, and **cast iron pinion** mounted on a **steel shaft** in the sheave housing and a **cast iron gear** mounted on the sheave shaft engaging with the pinion on the chain wheel shaft. As the Door opens, the upper Leaf swings around the upper hinges, the sill rail of the lower Leaf runs up in the jamb guides and the two Leafs open inward on the center hinge.

CANOPY DOOR Hardware is two **steel wall Brackets** attached to the building above each head corner, carrying a **cast iron Idler** mounted on a **steel Shaft, cast iron Roller Brackets and steel Rollers** at each jamb of Door at center, **formed steel counterweight Boxes, steel Guides** at each jamb of Door opening, attached to building, **Weatherstrips** at the sill and **Operator including cable.** (For light tube Doors less than 100 square feet area, Operator is not furnished unless specified).

Operator consists of a **cast iron housing** carrying two **cast iron cable sheaves** mounted on a **steel shaft** to the end of which is fastened a **cast iron chain wheel with jack chain** to within 4'0" from floor. A **steel stay arm** is bolted to the idler bracket and to a **steel bracket welded** to the Door rail approximately one third down from the head. **Motor drive** can be applied to this Operator, if specified. See Motor Drive Specification below. As the Door opens the head, supported and guided by the arm, moves toward the inside of the opening. The Door Leaf, moving up, swivels around the jamb roller moving in the structural guides. When full open, the lower portion of the Door Leaf projects outside the building, forming a canopy.

TWO SECTION VERTICAL LIFT DOOR Hardware is, a **steel Bracket** bolted to each upper corner of the upper Leaf, carrying a **cast iron chain Sheave on a steel Shaft.** An **adjustable steel chain Connector** is bolted to each upper corner of the lower Leaf. A **steel bracket**, attached to the building, carries two **cast iron chain sheaves on a steel shaft.** **Weatherstrips** are attached at the head of each Leaf. **Counterweights and Boxes, steel Guides** on each jamb of the Door opening, and **steel Clips** engaging with jamb guides are included, also **Operator including cable.** (For light tube Doors less than 100 square feet area, Operator is not furnished, unless specified).

Operator consists of a **steel housing** carrying a **steel shaft**, attached to which is a **cast iron hand wheel and jack chain** to within 4'0" from floor, and a **cast iron pinion.** The spur gear meshes with a **cast iron gear** carrying a **chain wheel**, over which the jack chain runs. **Motor Drive** can be applied to this Operator,

if specified. See Motor Drive Specification below. As the Door opens, the lower Leaf travels at twice the speed of the upper Leaf. When full open the lower Leaf is directly behind the upper Leaf.

MOTOR DRIVE

Motor Drive can be furnished for **Canopy and Two Section Vertical Lift Doors**. Standard drive is for 220 or 440 volt, 3 phase, 60 cycle A.C., Drive consists of an **enclosed ball or metaline bearing motor**, attached to the Power, drive pinion, sprocket and silent chain, magnetic reverse switch and limit switches and individual push button control. A **wiring diagram** is also furnished. **Main line switches and fuses, switch and fuse boxes, conduit and wiring are not part of the Motor Drive Specification.**

HOT DIP GALVANIZING

Doors can be **hot dip galvanized**, when specified, **after fabrication** and before shipment.

PAINT

Doors are given **one brush coat of grey mineral oxide paint** at the Factory before shipment.

INSTALLATION

See Installation Specification, Page 34.

GLASS AND GLAZING

Glass and Glazing do not come under the Door Specifications.

SPECIFICATIONS

FOR

HANGAR DOORS

Hangar Doors (See Plates, Pages 45 and 46) are made in two types — **straight slide** and **round the corner slide**, each type being furnished in **tube or structural** construction.

MATERIALS

Tubes, $2\frac{1}{2}" \times 2\frac{1}{2}" \times \frac{1}{4}"$ up to and including $4" \times 4" \times \frac{3}{16}"$, are **seamless steel**. (See Plate, Page 44). **Window panels** are standard **Fixed Glazing Angle Windows**. (See Page 4). **Top Rollers** are **malleable iron**. **Trucks** have **malleable iron wheels, steel housings and shafts and roller bearings**. **Hinges** are **forged steel**. **Hardware** is **malleable iron or rolled steel**. **Weathering** is 3 ply rubber weatherstripping.

CONSTRUCTION

Jamb rails run continuous from sill to head. **Head and sill rails** run continuous from jamb to jamb and are **full welded** to jamb rails on all four sides of joint.

Window panels are standard construction **Horizontally Pivoted fixed Windows**. (See Plate, Page 5 and Page 3). Panels are **welded** to rails.

Plate panels are patent leveled No. 12 gauge **steel sheets, welded** to the rails.

Pilot Door is a tube Door, not to exceed $3' 0" \times 7' 0"$, (see Page 39), with a tubular or structural frame, and Cylinder Lock with bronze handles.

End Doors (See Plate, Page 45) for round the corner type Doors are a swing Leaf carried on the Door jamb by heavy **forged strap hinges**.

TRUCKS AND HARDWARE

Top rollers are mounted on a **steel shaft**, carried on a **pressed steel bracket** bolted to the top rail.

Trucks. At each lower corner of the Door Leaf an opening is provided by a vertical and horizontal rail, which carries the truck. Trucks consist of a **malleable iron wheel** mounted on **roller bearings**, machined to fit a 12 pound standard rail. Adjusting sheaves or trunnions are provided. Bearings have **alemite lubrication**. The housing carrying the wheel adjustors and bearings is through bolted to the Door rails. For Round the Corner type Doors the Trucks swivel.

Hardware consists of a **Cremone Bolt** for end Door Leafs, and a **Cane Bolt** and **malleable iron Door Pull** for all other Leafs.

HOT DIP GALVANIZING

Hangar Doors cannot be hot dip galvanized.

PAINT

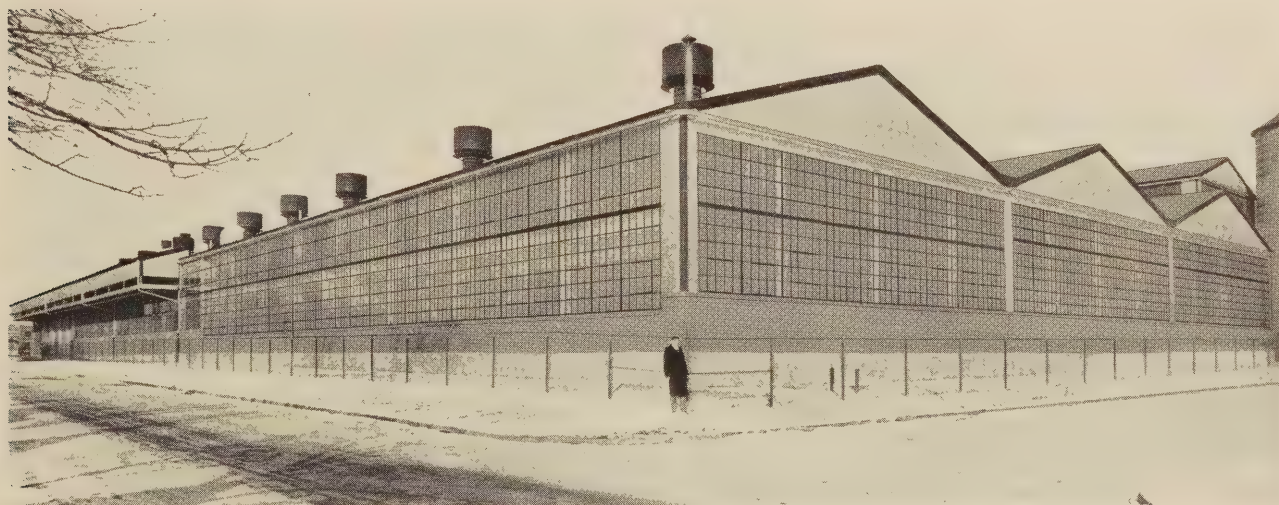
Hangar Doors are given **one brush coat of grey mineral oxide paint** at the Factory before shipment.

INSTALLATION

See Installation Specification, Page 34.

GLASS AND GLAZING

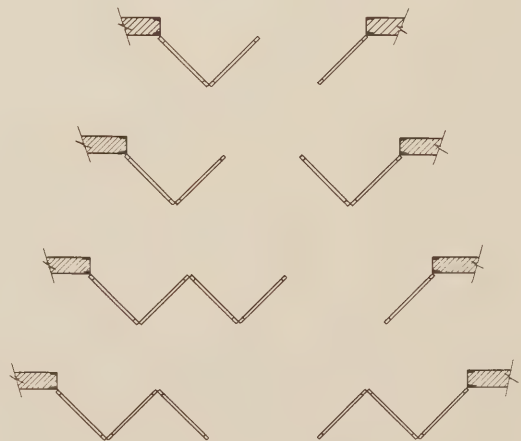
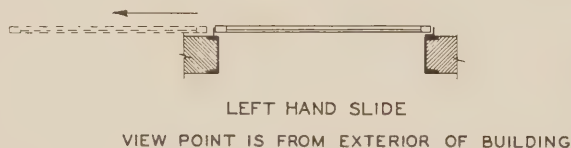
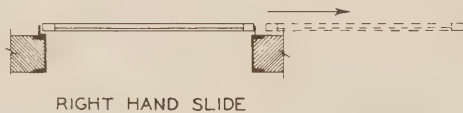
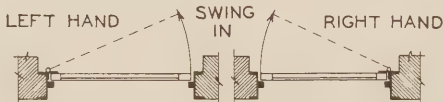
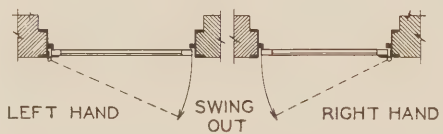
Glass and glazing do not come under the Door Specification.



OPENING HEIGHT	SINGLE DOORS						DOUBLE DOORS					
	OPENING WIDTH						OPENING WIDTH					
	2'-0"	3'-0"	3'-6"	4'-0"	5'-0"	6'-0"	5'-0"	6'-0"	7'-0"	8'-0"	10'-0"	12'-0"
7'-0" 7'-6" 8'-0" 10'-0"												
11'-0" 12'-0" 13'-0"							DOORS OF THESE HEIGHTS ARE SPECIAL					
14'-0" 15'-0"												

DIMENSIONS GIVEN ARE FOR SWING DOORS ONLY.
ALL DIMENSIONS ARE INSIDE MEASUREMENTS OF FRAME.

DIMENSIONS FOR SLIDE DOORS ARE 3" LESS IN WIDTH
AND 1 1/2" LESS IN HEIGHT THAN DIMENSION GIVEN.

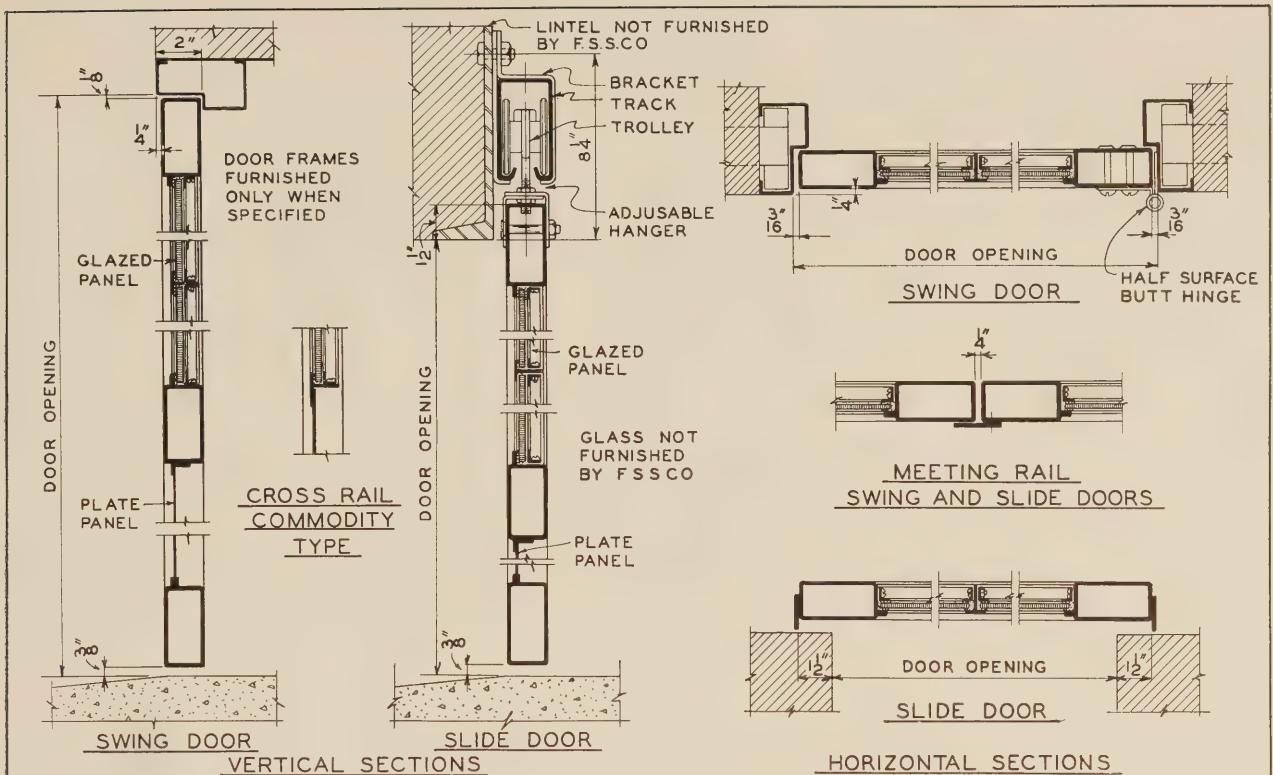


ACCORDION DOORS

INDUSTRIAL DOORS

**FEDERAL
WELDED STEEL
DOORS**

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COMMODITY TYPE DOORS

	SINGLE DOORS			DOUBLE DOORS		
TYPE						
SWING DOOR	A	B	C	D	E	F
OPENING SIZES	2'-6" x 7'-0"	3'-6" x 7'-6"	5'-0" x 10'-0"	5'-0" x 7'-0"	7'-0" x 7'-6"	10'-0" x 10'-0"
SLIDE DOOR						
OPENING SIZES	2'-3" x 6'-10 1/2"	3'-3" x 7'-4 1/2"	4'-9" x 9'-10 1/2"	6'-0" x 7'-0"	8'-0" x 8'-0"	9'-9" x 9'-10 1/2"
	2'-9" x 6'-10 1/2"	3'-9" x 7'-10 1/2"	4'-9" x 9'-10 1/2"	5'-9" x 6'-10 1/2"	7'-9" x 7'-10 1/2"	

STANDARD DOOR LEAFS

G							
SWING DOOR LEAF							
MAX. 5'-0" x 10'-0"			MAX. 5'-0" x 12'-0"			MAX. 5'-0" x 15'-0"	
SLIDE DOOR LEAF							
MAX. 4'-9" x 9'-10 1/2"	MAX. 9'-9" x 9'-10 1/2"	MAX. 4'-9" x 11'-10 1/2"	MAX. 9'-9" x 11'-10 1/2"	MAX. 11'-9" x 9'-10 1/2"	MAX. 4'-9" x 14'-10 1/2"	MAX. 7'-9" x 14'-10 1/2"	

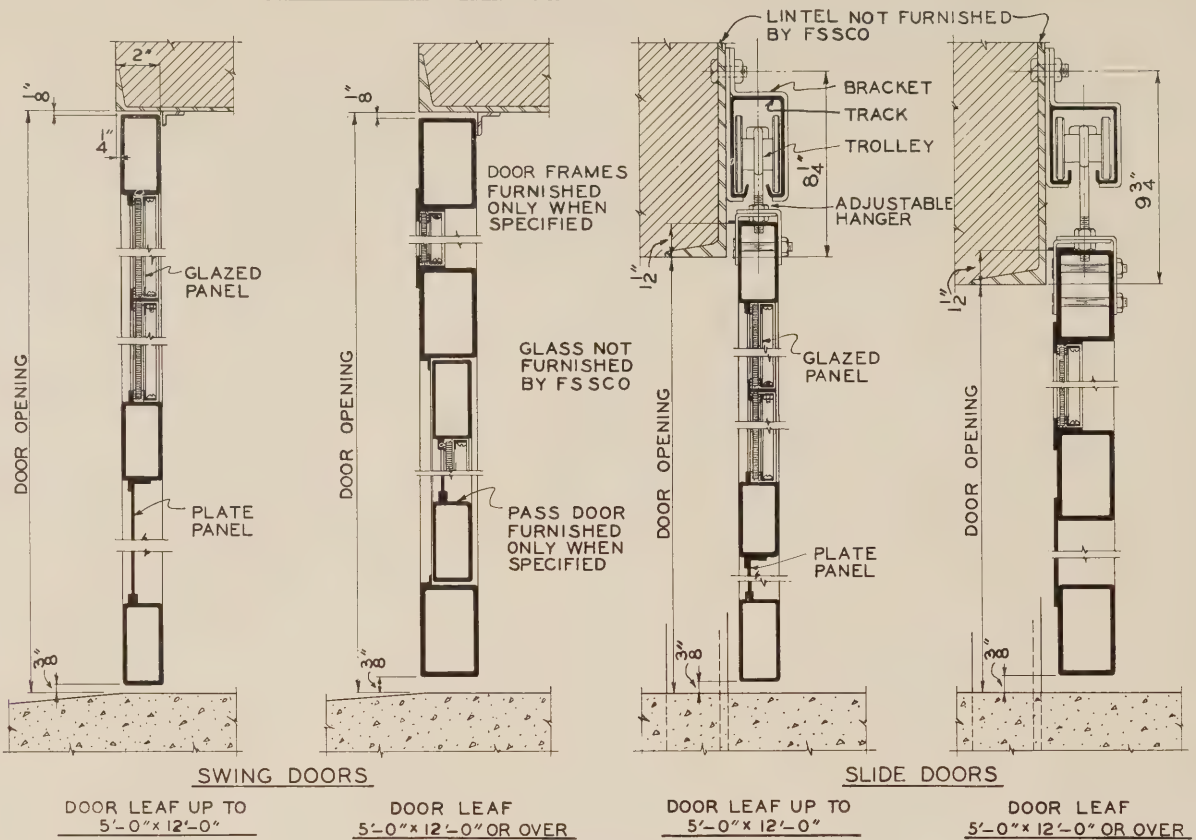
DOORS CAN BE FURNISHED WITH ALL PLATE, WINDOW, OR PLATE AND WINDOW PANELS.

LIGHT INDUSTRIAL
SWING AND SLIDE DOORS

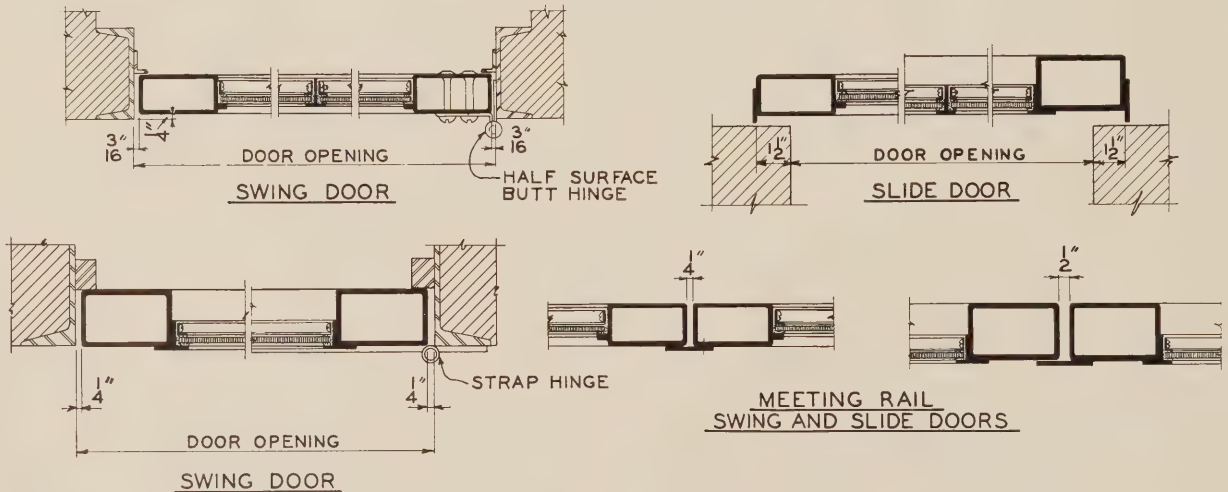
**FEDERAL
WELDED STEEL
DOORS**

SCALE 1 1/2" = 1'-0"

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VERTICAL SECTIONS



HORIZONTAL SECTIONS

HARDWARE AS SPECIFIED

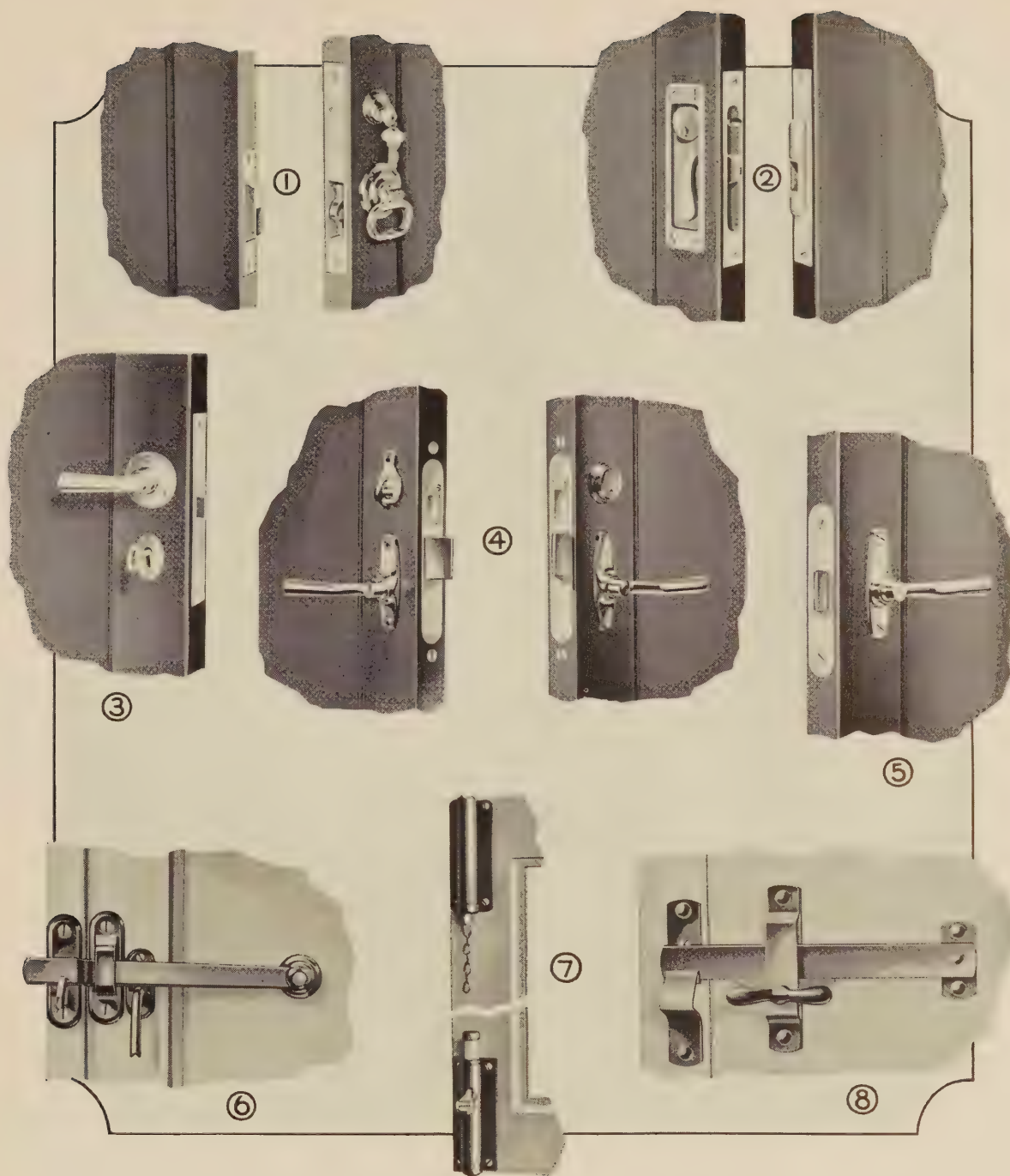
ACCORDION DOOR
CONSTRUCTION DETAILS SIMILAR

HEAVY INDUSTRIAL
SWING AND SLIDE DOORS

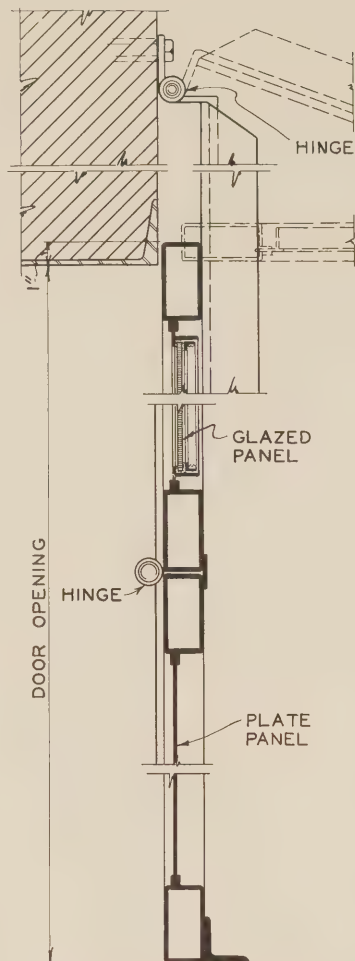
FEDERAL
WELDED STEEL
DOORS

SCALE 1/2" = 1'-0"

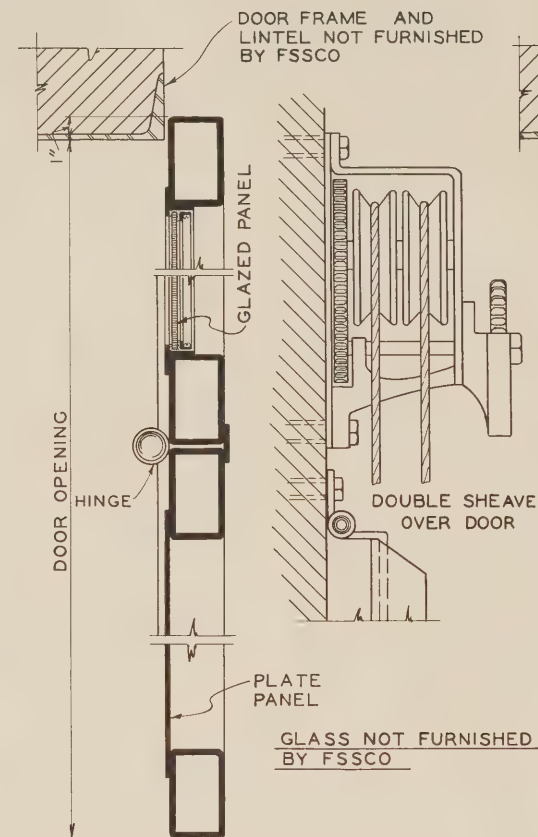
1-36



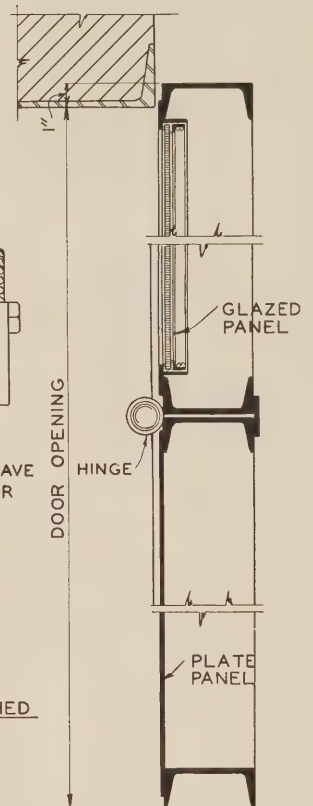
- 1—Sliding Door Lock with Cylinder and Drop Handle.
- 2—Sliding Door Lock with Cylinder and Flush Handle.
- 3—Bit Key Lock.
- 4—Cylinder Lock with Dead Bolt and Thumb Turn.
- 5—Mortise Latch.
- 6—Lever Latch—Thumb Lift.
- 7—Top and Bottom Bolt.
- 8—Lever Latch—Tee Handle.



LIGHT TUBE TYPE
10'-0" x 12'-0"

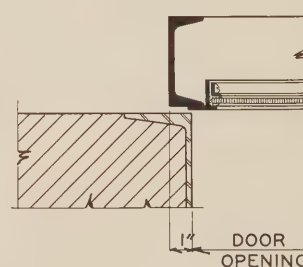
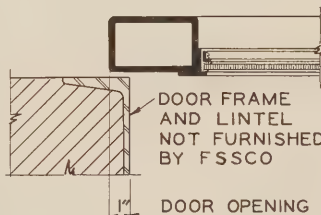
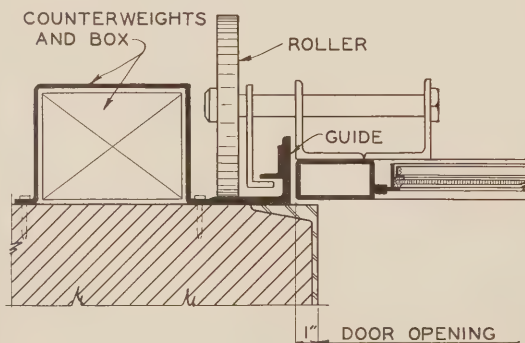


HEAVY TUBE TYPE
14'-0" x 16'-0"



STRUCTURAL TYPE
14'-0" x 16'-0"

VERTICAL SECTIONS

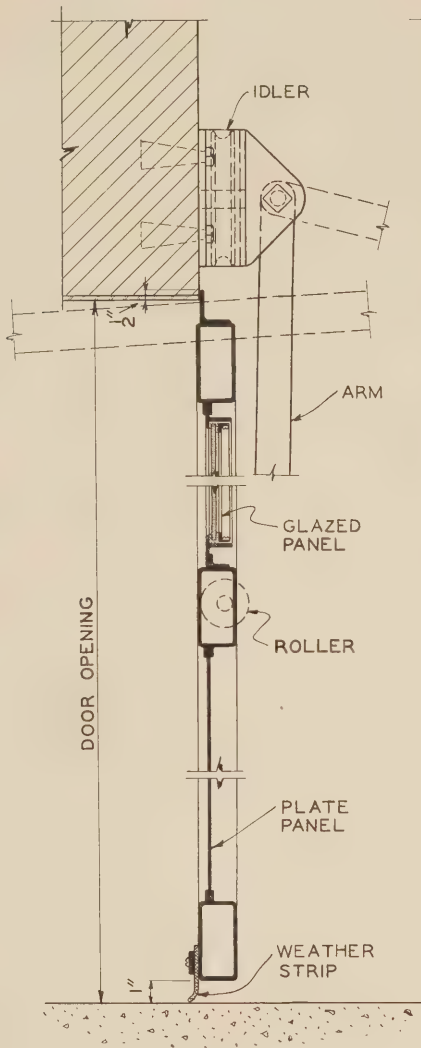


HORIZONTAL SECTIONS

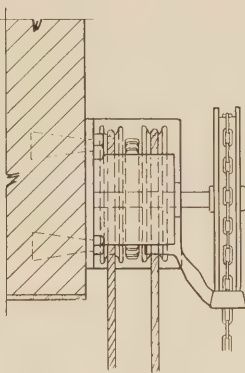
SCALE $\frac{1}{2}" = 1'-0"$

BIFOLD DOORS
FEDERAL
WELDED STEEL
DOORS

1-36

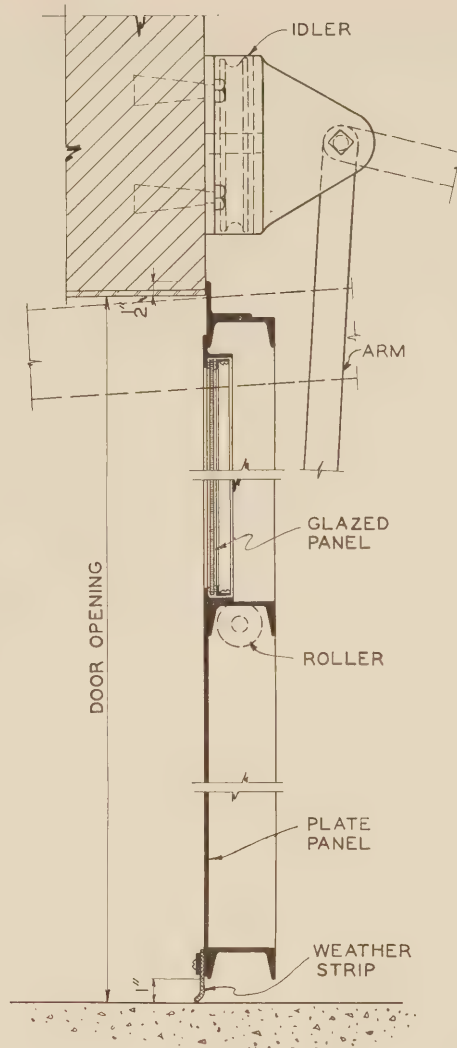


LIGHT TUBE TYPE
12'-0" x 10'-0"



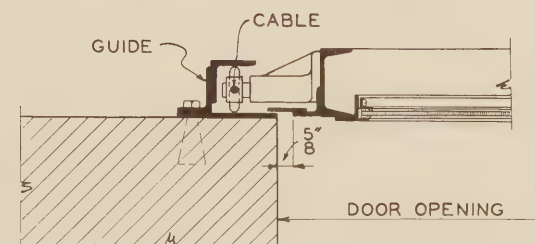
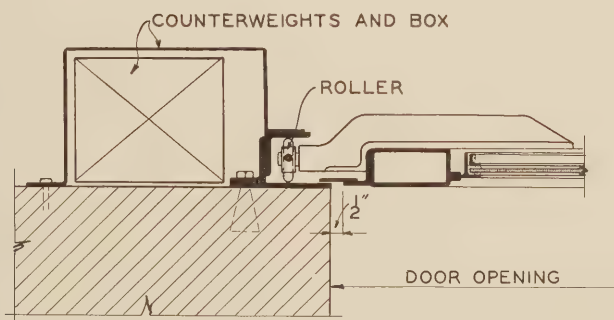
POWER

GLASS NOT FURNISHED
BY FSSCO



STRUCTURAL TYPE
20'-0" x 20'-0"

VERTICAL SECTIONS



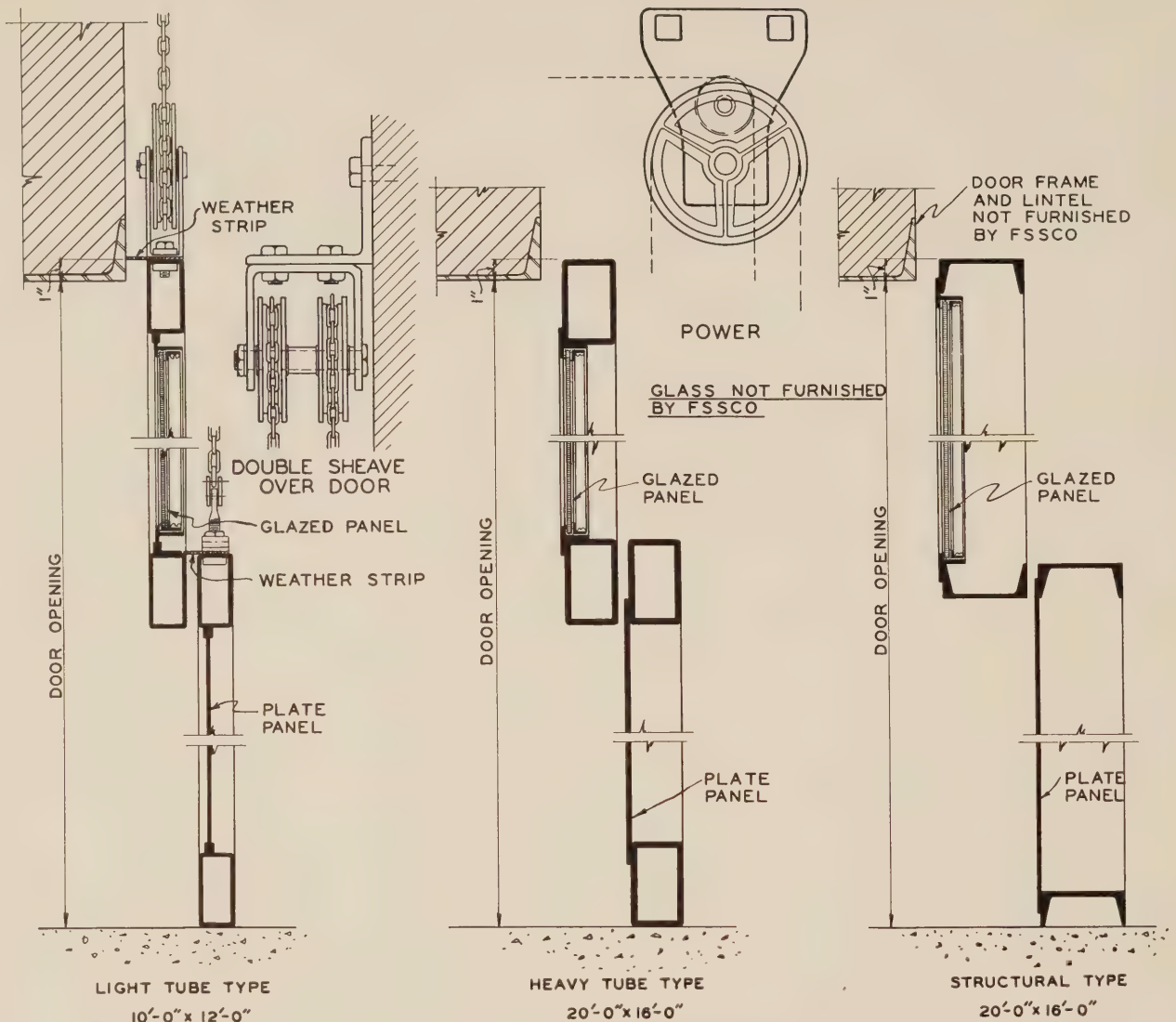
HORIZONTAL SECTIONS

CANOPY DOORS

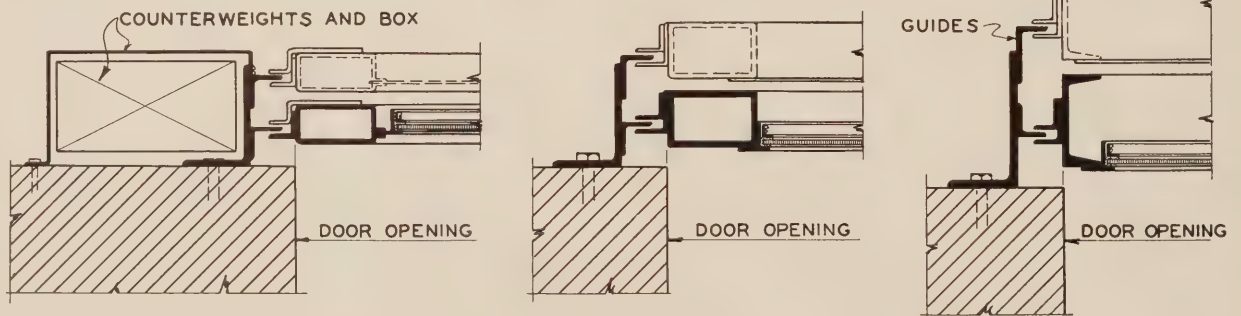
**FEDERAL
WELDED STEEL
DOORS**

SCALE $1\frac{1}{2}" = 1'-0"$

1-36



VERTICAL SECTIONS



HORIZONTAL SECTIONS

TWO SECTION VERTICAL LIFT DOOR

**FEDERAL
WELDED STEEL
DOORS**

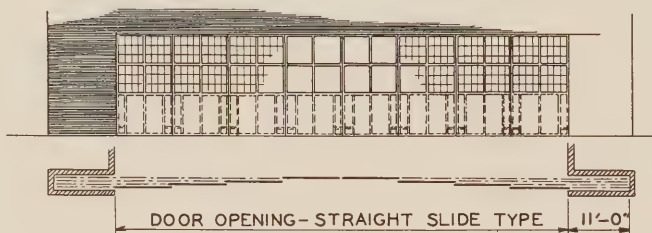
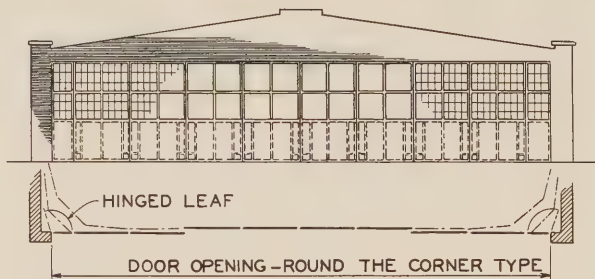
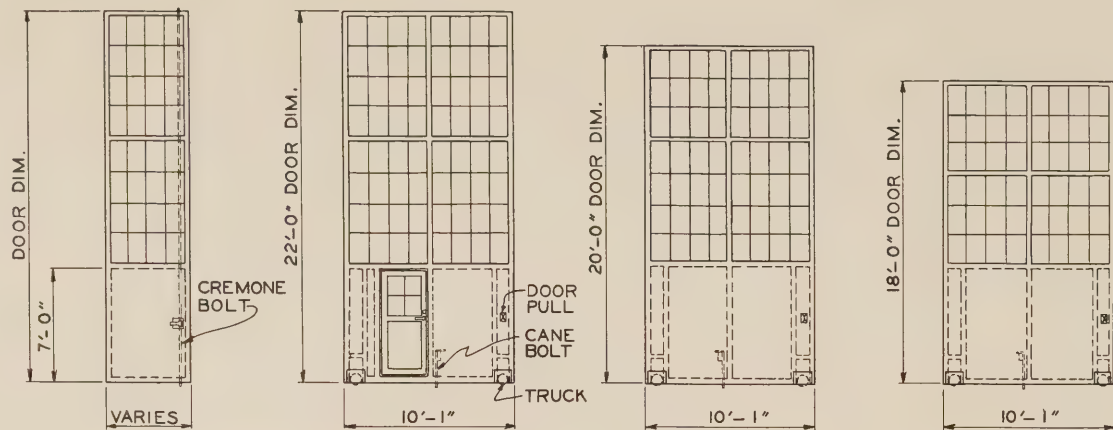
SCALE $\frac{1}{2}" = 1'-0"$

I-36

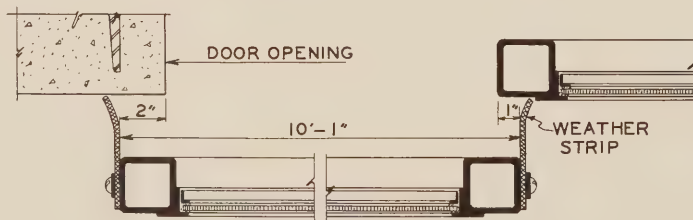


DOORS

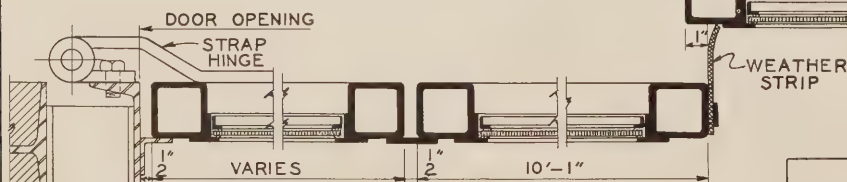
HALF SIZE SECTIONS



TYPICAL PLAN AND ELEVATION

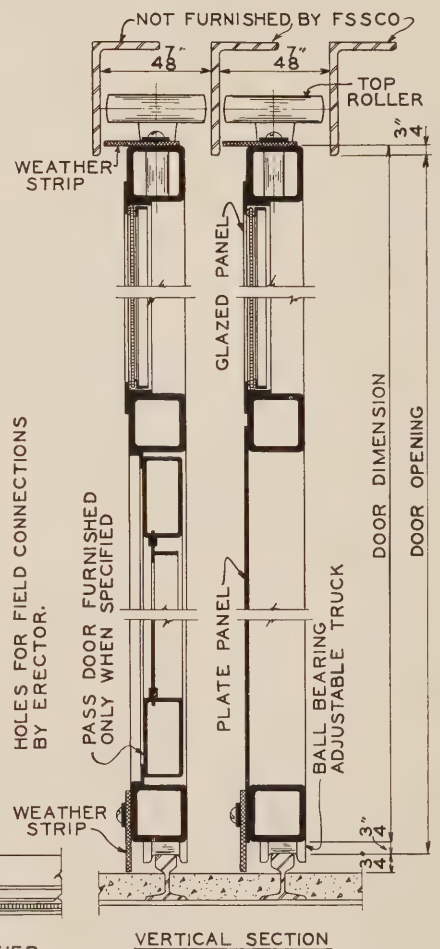


HORIZONTAL SECTION STRAIGHT SLIDE TYPE



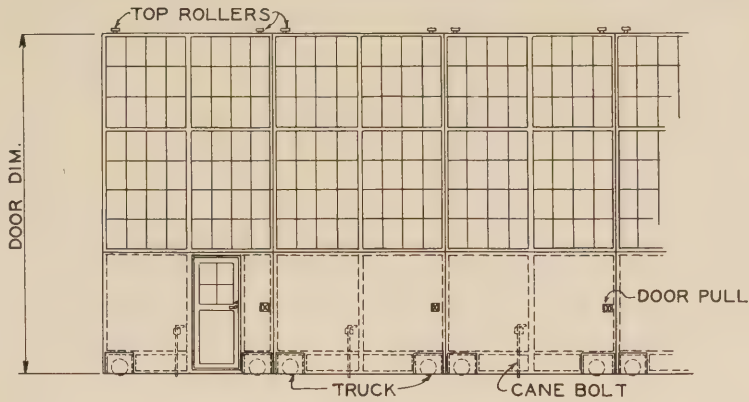
HORIZONTAL SECTION ROUND THE CORNER TYPE

SCALE $\frac{1}{2}'' = 1'-0''$



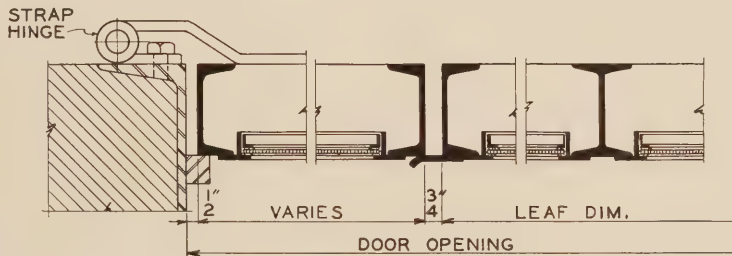
HANGAR DOORS
FEDERAL
WELDED STEEL
DOORS

1-36



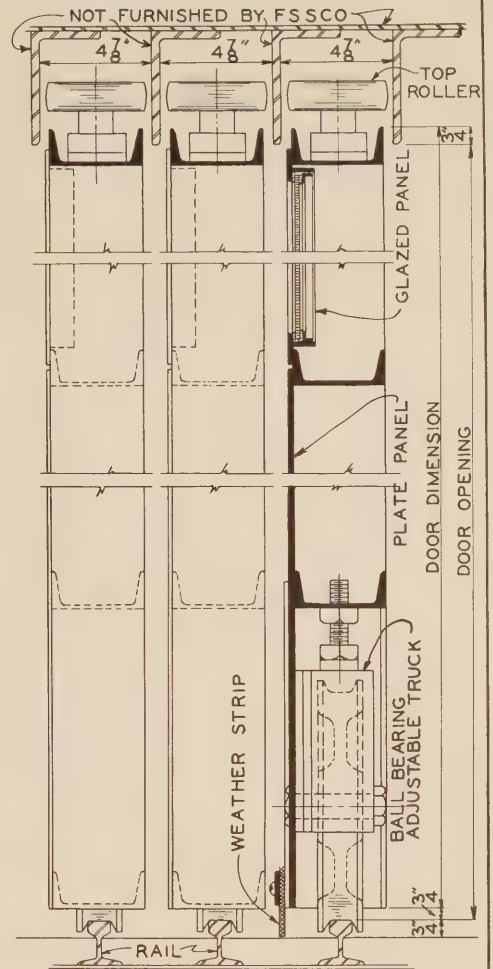
EXTERIOR ELEVATION

PASS DOOR FURNISHED
ONLY WHEN SPECIFIED.

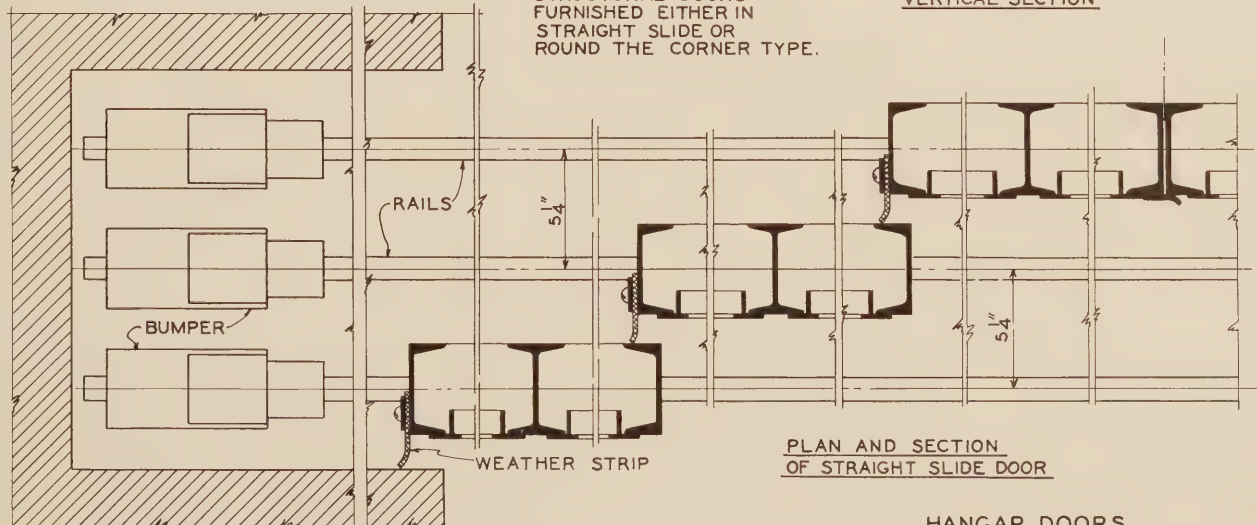


HORIZONTAL SECTION

RAILS, TIES, ANCHORS, FOUNDATIONS
AND GUIDES NOT FURNISHED BY FSSCO.
HOLES FOR FIELD CONNECTIONS
BY ERECTOR.



VERTICAL SECTION



STRUCTURAL DOORS
FURNISHED EITHER IN
STRAIGHT SLIDE OR
ROUND THE CORNER TYPE.

PLAN AND SECTION
OF STRAIGHT SLIDE DOOR

HANGAR DOORS
FEDERAL
WELDED STEEL
DOORS

SCALE $\frac{1}{2}'' = 1' - 0''$

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